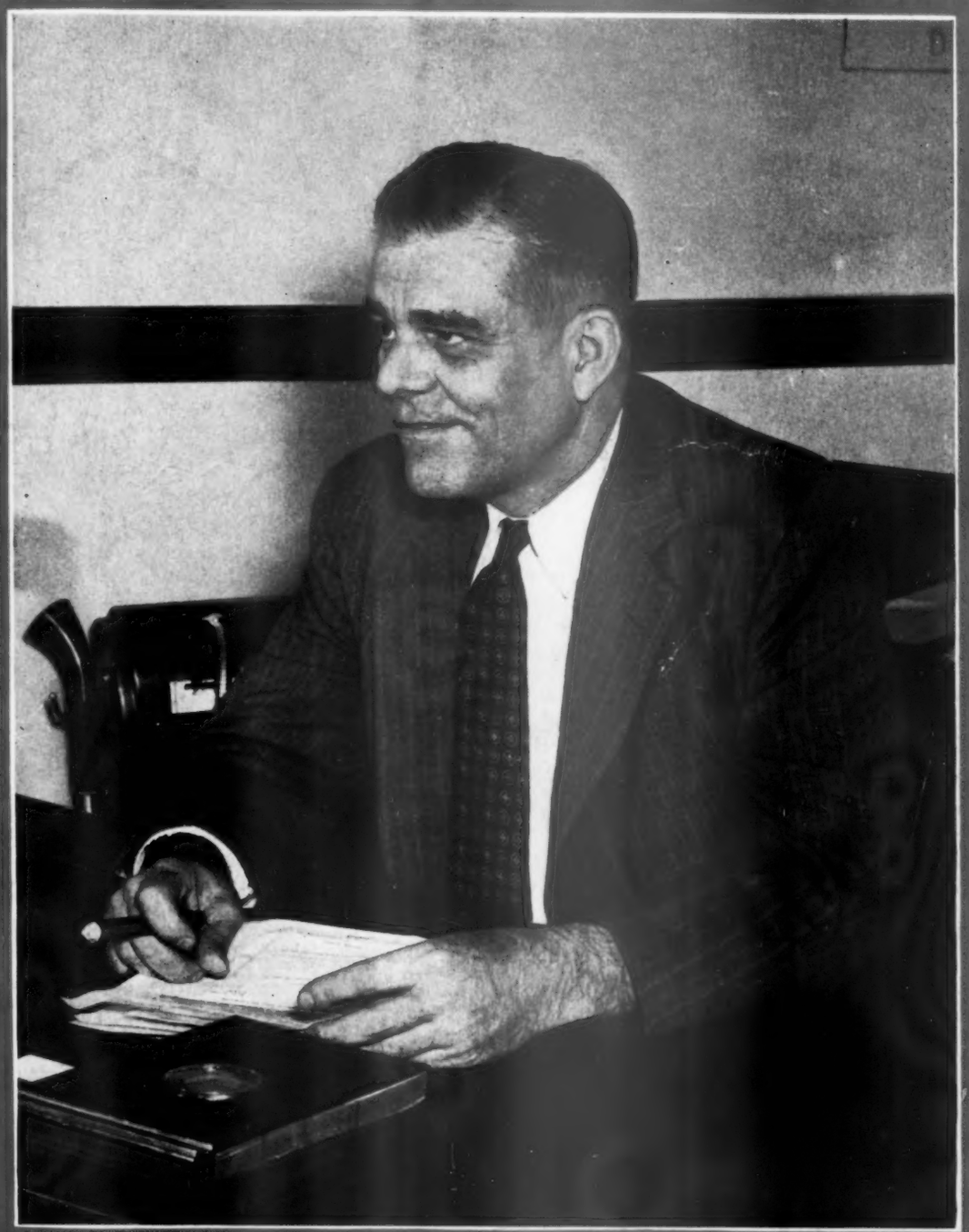
PURCHASING

THE NATIONAL MAGAZINE FOR PURCHASING AGENTS



L. C. HODGES See Page 69

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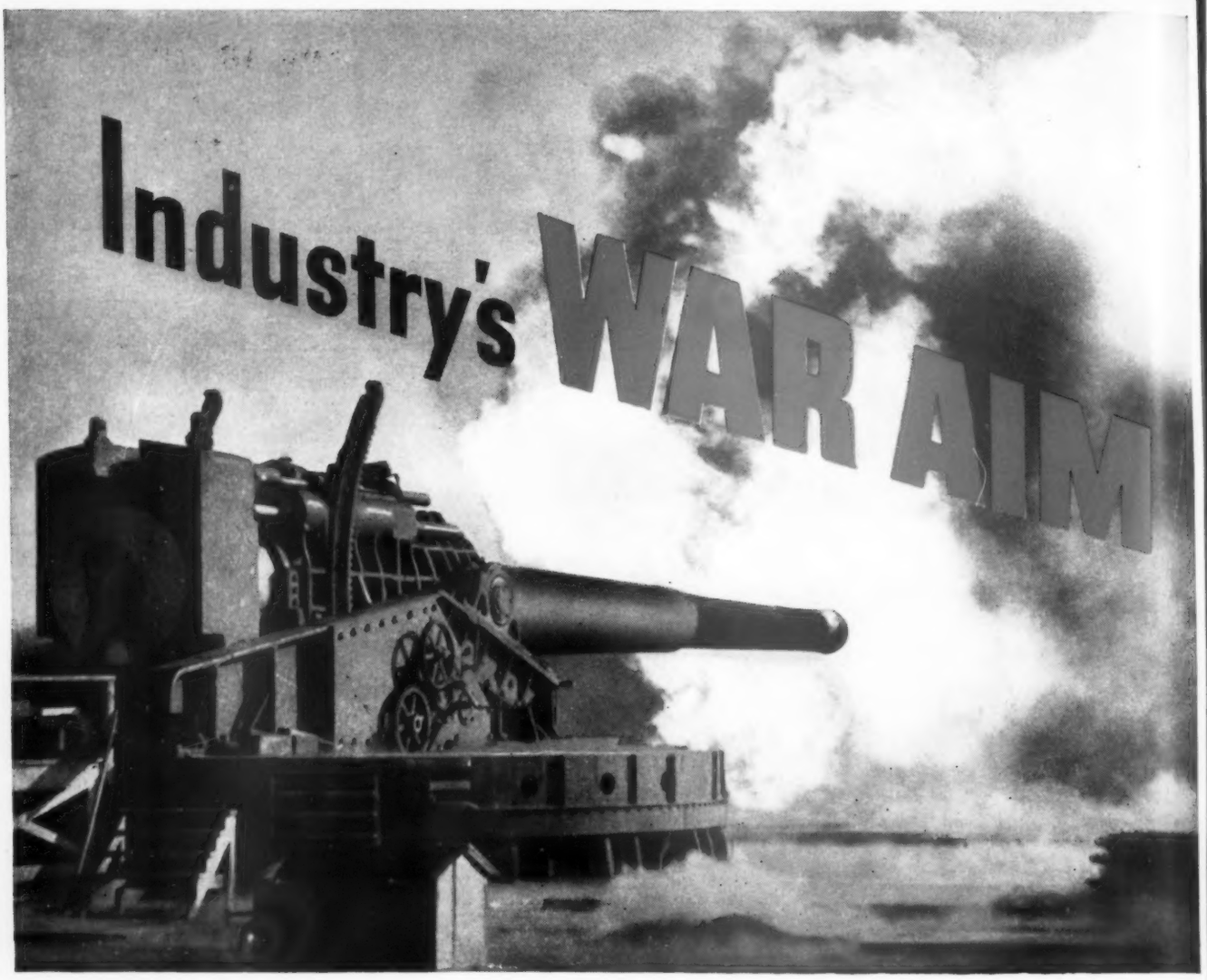

AIMED point blank at its target, this giant 16-inch gun is testing various types of powder charges at the Aberdeen Proving Ground. The production in unprecedented numbers not only of 16-inch guns, but of shells, tanks, ships, planes is likewise the aim of industry to speed the coming victory.

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312

Thus, when a Century Motor is bolted to a machine or foundation, you can expect uniform and quiet operating characteristics to be maintained for continuous service, 3-shift operation.

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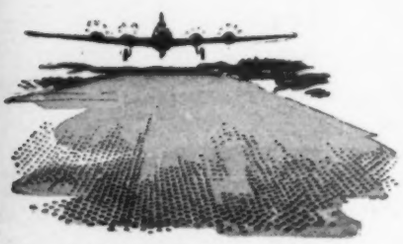

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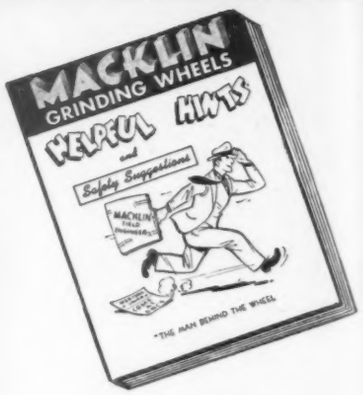

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☐ **2. TWIN UNIT CRANE**—A two-in-one materials handling tool is covered by four-page bulletin, which described Yale Model K23E-6C2T—6,000 lbs. capacity combined with 2,000 lbs. capacity cable crane. Every operation of this electric industrial truck is mechanized. Yale & Towne Mfg. Co.

☐ **3. FACTORY BRUSHES**—Bulletin tells about heavy duty and double duty Speed Sweep brushes, and gives prices. Milwaukee Brush Co.

☐ **4. ENTIRE LATHE LINE**—New catalog describes entire line of engine, toolroom and turret lathes. Each size and type is illustrated and fully described. South Bend Lathe Works.

☐ **5. FREQUENCY METERS**—Preview of new type of vibrating reed frequency meters describes application, design and operating features. Complete information in special bulletin. Alan Bridgman Sanger.

☐ **6. BALANCED LIGHTING**—Well illustrated booklet describes general fluorescent lighting and individual lighting for close-seeing critical work areas for well balanced lighting. The Fostoria Pressed Steel Corp.

☐ **7. METAL CUTTING SAW BLADES**—Small handbook shows how to get the most out of hand saw machines and band saw machines, hack saw blades, and hack saw machines. The Capewell Manufacturing Co.

☐ **8. KEEPING FLUIDS CLEAN**—Booklet "Quick Facts on Keeping Fluids Clean" gives factual information about 11 major industrial classifications, and 46 case studies—aircraft, machine tools, engines, special machinery, metal working, process industries, etc. Cuno Engineering Corp.

☐ **9. EARLY STRENGTH CONCRETE** — Book describes the use of Calcium Chloride in concreting for high early strength, cold weather protection, earlier finishing, uniform curing, greater strength. Calcium Chloride Association.

☐ **10. BAR WINDOWS** — Aluminum and Wood, Catalog describes Geyer System and give sspecifications. Simplicity of design is said to be pleasing and to make for reduced cleaning and maintenance costs. E. K. Geyser & Co.

☐ **11. BLACK OXIDE FINISHING, Surface Preparation**—Pocket size booklet describes equipment and materials and procedure for surface preparation of ferrous and non-ferrous metals and alloys for black finishing. Oakite Products, Inc.

☐ **12. LUBRICATION** — Unique 64-page catalog for 3 x 5 desk file, lists lubricating problems and gives answers. Covers wide variety of lubricants including related products such as cutting oils, drawing compounds solidified oils, solvents, rust preventives, etc. Wells Petroleum Co.

☐ **13. BIG LIFT TRUCK**—Pneumatic tires, and hydraulic lift of 7,500 lbs. capacity on 42-inch load arms, feature new lift truck designed to carry loads up grades and over uneven surfaces, described in four page bulletin. Travel speed 7 to 12 m.p.h. Equipped with 4-cyl. 34 h. p. industrial motor; equipped with starter. Willamette Hyster Company.

☐ **14. AUTOMATIC CONTROL**—Four-page bulletin describes magnetic contractors, remote control switch, and automatic transfer switches for use where continuous lighting is necessary. Operation of transfer switch is automatic, instantaneous and positive, eliminating interruption and lag Zenith Electric Co.

☐ **15. VOLTAGE STABILIZER**—Eight-page booklet describes new voltage stabilizer which provides a constant output of 115 volts from circuits varying between 95 and 130 volts Can be applied wherever close voltage regulation is requisite to good operation. General Electric Co.

☐ **16. ROOF VENTILATORS** — New roof ventilators of non-critical materials are illustrated and described in 8-page catalog, which also shows installation methods and standard applications. Guaranteed to give satisfactory service. The Swartwout Co.

☐ **17. RADIO & ELECTRONICS**—100 page catalog of all types of radio and electronics supplies for production lines and maintenance, research and control laboratories, war training and combat—a quick reference buying guide. Allied Radio Corp.

☐ **18. MIDGET MILLING CUTTERS** for the metal, wood and plastics industries, made of high speed steel "ground from the solid after hardening"—all sizes—all shapes, are described in recent bulletin. Severance Tool Co.

☐ **19. CASTINGS, Non-ferrous** — Bulletin details facilities for producing magnesium, aluminum, bronze, brass and other non-ferrous metals. Weight comparisons and mechanical properties of magnesium are shown, along with other information of value to buyers. Howard Foundry Co.

☐ **20. PRODUCTION MACHINE TOOLS** and woodworking production tools and accessories are shown in 52-page catalog of illustrations and detailed information on power tools. Delta Mfg. Co.

☐ **21. MATERIAL HANDLING AND PROCESSING**—176 page catalog covers complete line of electric vibrating equipment for material handling and processing operations,—feeding, conveying, cooling, drying, packing, screening, etc. The Jeffrey Manufacturing Co.

☐ **22. TRUCK BATTERY GUIDE** — Gives replacement data on batteries for trucks,

(*Continued on page* 12)

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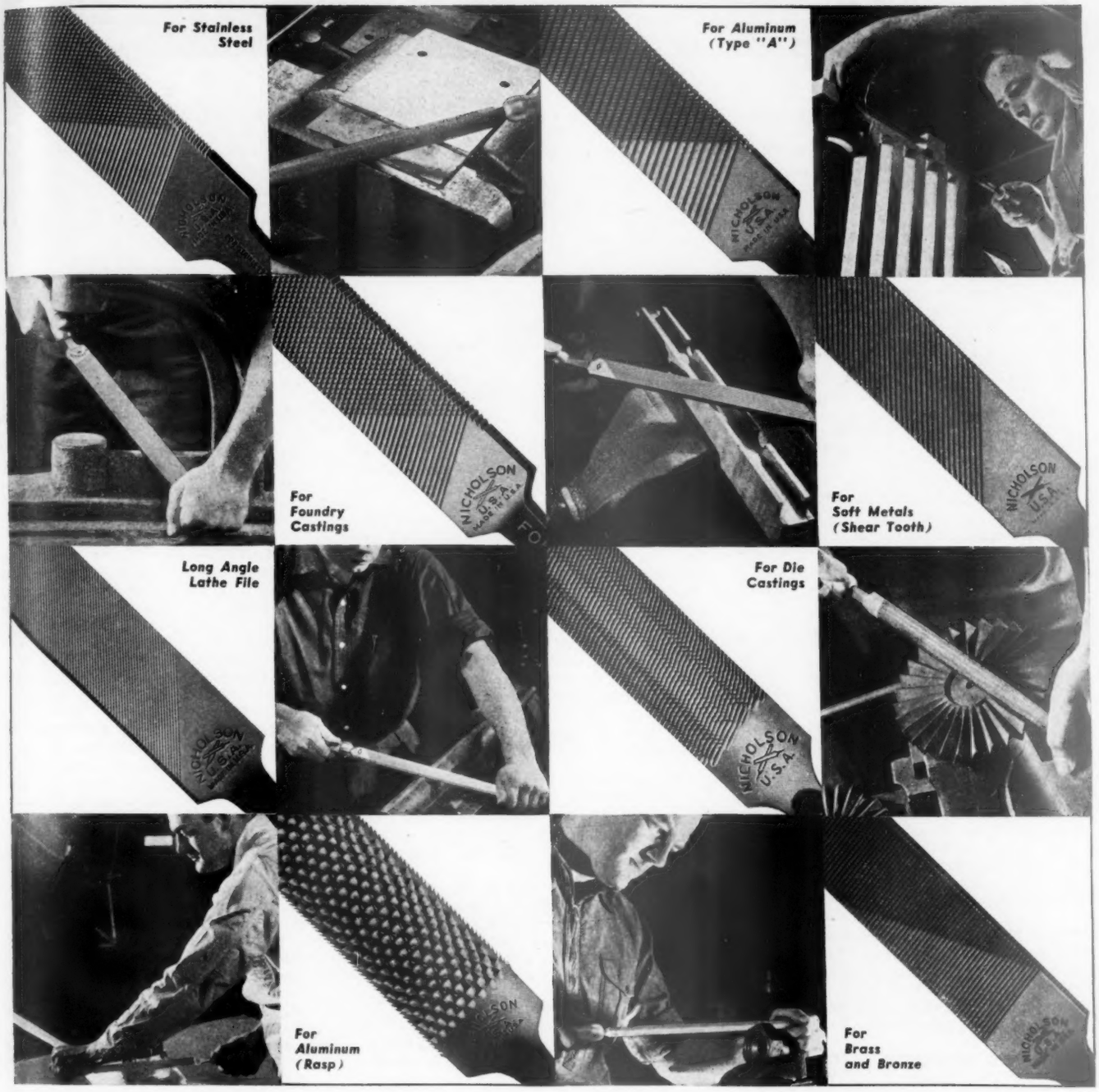
Four pages of "Know How"—10-12-14-16



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buses and tractors, according to make, year and model, list prices for truck and bus batteries; also information on Diesel starting batteries, chart of capacities types and dimensions, recommended substitutions, etc. U. S. Rubber Co.

☐ **23. PORTABLE INDUSTRIAL FIRST AID Cabinet** — Bulletin describes Prompt-Aid Medical Cabinet, featured by portability, compactness, convenience, professional design, dustproof construction. Ruggedly built. J. E. Erback Co.

☐ **24. BLUE PRINTS, SEPIA Prints,** Reproduced tracings, direct process prints, etc. Handbook of Print-Making and Processing, 40 pages, describes methods and equipment, and advtanges and disadvantages of various processes. Charles L. Rumrill & Co.

☐ **25. COPPER-COATED Soft Steel Tubing** and portable flaring tool which produces a double-lap flare on steel and nonferrous tubing 3/16" to 5/8" OD, are described in two catalog pages. Double-flare makes stronger and more durable joint. Everhot Products Co.

☐ **26. MACHINE TOOL Control** — Broadside shows cutaway, sectional view of automatic machine tool control known as Duplimatic for putting intricate milling, turning, boring, shaping, die-sinking and similar operations on high speed production basis. Detroit Universal Duplicator Co.

☐ **27. AIR EXPRESS** — Indexed handbook gives the Who, What, Where, When and How of Air Express Shipping. Contains priority primer, list of district and regional priority offices with address and 'phone numbers, and facts on data on flying time, weights, and cost. Air Express Divn., Ry. Express Agency.

☐ **28. RIVNUTS**—Internally threaded and counterbored tubular rivet that can be headed blind. Catolog describes various types, installation, tools used, and gives data on physical characteristics, and table of average weights. B. F. Goodrich Co.

☐ **29. PIPE TEMPLATES** — Catalog describes Pipe Templates for Welded fittings, illustrates connections that may be fabricated, process, and tells how to develop pipe templates. Air Reduction.

☐ **30. HYDRAULIC POWER and Test Units**—Four-page catalogs. Power Unit section shows 10 models for use with new machines or for change-over to hydraulics. They may be adapted to any motion desired for feed and traverse of multiple or single tools, indexing, locating, etc. Test Unit section shows models for checking hydraulics before and after assembly, including portable unit. Hydraulic Machinery, Inc.

☐ **31. MOTORIZING CONE DRIVEN Machine Tools**—Catalog describes Western transmissions and their adaptability to most any cone driven machine tool. 14 installations are pictured. Western Manufacturing Co.

☐ **32. HONOR ROLL Boards**—Changeable strips or changeable letters, described in bulletin, permit adding of names. Five different types illustrated and described. Acme Bulletin & Directory Board Corp.

☐ **33. GRINDING POINTS with Demountable Spindles**—Spindle is unscrewed and placed in new wheel or point, need not be removed from grinder chuck or head. Spindles cannot break-off, pull-out or twist and turn. These new Victory points are described in 4-page bulletin. Abrasive Company.

☐ **34. WELDING POSITIONER** — Hand operated, 2,500 lbs. capacity, is described in new bulletin. Adjustable type base provides adjustment from 29½" to 47½" from floor line to table top. Ransome Machinery Co.

☐ **35. COPYHOLDER**—For stenographers, bookkeepers, invoicing, etc. Made of non-essential war materials. Comes in 3 sizes—9½", 12½" or 18½" wide. Franklin Black & Co.

☐ **36. LATHE Catalog** — New catalog is devoted to South Bend 9" Lathes, Models A, B, & C; describes the bench and metal column base types available in three models. South Bend Lathe Works.

☐ **37. AIRCRAFT TUBING Data** — New sheets bring up to date the Aircraft Tubing Specifications for both Government and Aeronautical Material specifications covering seamless, welded and stainless tubing, new data on maching and heat treating chart for NE-8630 steel included. Limited supply available. Summerill Tubing Co.

☐ **38. CARE OF SAFETY Devices,** respirators, goggles, helmets, etc. Five-page report tells how to keep equipment in A-1 condition; chemical treatment for glass shields in welding hoods, germicidal treatment of respirators, etc. Oakite Products Inc.

☐ **39. ELECTRONIC adjustable-speed drive,** Mot-O-Trol, which provides wide stepless range, automatic speed regulation and smooth fast acceleration with automatic current limitation is described in 4-page illustrated booklet. Westinghouse Elec. & Mfg. Co.

☐ **40. SPRINGS**—Manual on spring design and engineering is quite complete in formulas of spring design and engineering for compression, extension, torsion, flat spiral or motor, flat springs, wire forms, etc., with illustrations, diagrams and tables. Provides Purchasing Agent with all required information. Mid-West Spring Mfg. Co.

☐ **41. MEASURING AND CONTROL Instruments**—New condensed catalog gives current prices and short description of all Wheelco instruments, and refers to other bulletins that cover particular instruments. Wheelco Instrument Co.

☐ **42. ELECTRIC TREE FALLER**—52" soft wood log has been cut in 70 seconds. Reduces manpower requirements 60 to 75%. It will cut either straight across the grain or at an angle which permits making any type undercut desired. Employs special patented design cutter chain. Described in a 6-page folder. E. C. Atkins & Co.

☐ **43. ELECTRICAL RECTIFIERS** — New catalog sheets describe over 50 new models of industrial electrical rectifiers; advantages are explained and price list is included. McColpin-Christie Corp.

☐ **44. SECTIONAL VISIBLE RECORD Equipment**—Price list illustrates and describes Victor Wood sectional visible record equipment. Victor Safe & Equipment Co.

☐ **45. DEGREASING equipment** for internal cleaning of gear cases, enclosed transmission, oil reservoirs and lines, heat exchangers, motor housings, etc., with vapor, is described in four-page bulletin. Circo Products Co.

☐ **46. HONOR ROLLS,** Bronzed Name Plates, Placques, etc., are illustrated in 64-page catalog. Balantyne Supply Co.

☐ **47. FLUORESCENT LIGHTING**—Bulletin describes new Day-Line unit which is said to incorporate high efficiency and ease of installation and easy removal and replacement of reflectors. Basic fixture may be used for single unit or continuous installations. Day-Lite Lighting Inc.

(*Continued on page* 14)

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7/43

Check each page of "Know How"—10-12-14-16

★ WPB ORDER M-24C REQUIRES YOU TO
Classify Scrap
at the Source-
SEGREGATE INTO THESE OFFICIAL CLASSIFICATIONS:
1. Nickel Steels (Ni 1%-2%) and Nickel-Chromium Steels (Ni 1%-2.25%) as 2100, 3100, 3200 series
2. Nickel Steels (Ni 2%-5.25%) as 2300, 2500
3. Nickel-Chromium Steels (Ni 2.25-5.25%) as 3300, 3400
4. Nickel-Molybdenum Steels (Ni 1-5.25%) as 46-4800
5. Ni Cr Moly Steels (Ni 1% and under) as 86-87-88-8900
6. Ni Cr Moly Steels (Ni 1%-5.25%) as 4300
7. Molybdenum Steels (Moly 0.15-0.65%) as 4000, 4100, 80-81-82-83-84-8500
8. Molybdenum Steels (Moly over 0.65%) as Mn-Mo Bullet Core
9. Chromium Steels and Chromium-Vanadium Steels (Cr 0.70-1.75%) as 52100-5100-6100
TOOL STEELS 10. Class A High Speed Steels (containing [1] at least 0.60% carbon and 3.0% Moly or [2] at least 0.60% carbon, not over 7.0% tungsten and at least 3.0% molybdenum) 11. Class B High Speed Steels (at least 0.55% carbon and 12% tungsten 12. Tungsten-bearing Hot Work Steels
CORROSION AND HEAT RESISTING 13. Chromium 10-14% inclusive 14. Chromium 15-18% incl. 15. Chromium over 18%. 16. Chromium 16-20% incl. and Nickel 8-10% incl. 17. Chromium 21-30% inclusive. Nickel 11-20% inclusive. 18. All other grades of corrosion and heat resisting alloy irons and steels containing chromium, nickel, molybdenum, cobalt, or copper.

Segregating scrap, as required under WPB Order M 24 C, is a difficult task, but it is absolutely necessary — there is no alternative. Production of fighting equipment made from alloy steels must not bog down.

War has shut the door on many sources of supply for essential elements, such as chromium, vanadium, nickel, which put the "fight" in steel. As a result, most of the alloys must be redeemed from the steel itself. For instance, in the manufacture of a precision part of an airplane, only 20 per cent of the original steel ingot is actually used. The other 80 per cent becomes scrap in the form of turnings and other by-products of the various machining and finishing operations.

Recovery of the essential alloys from machine turnings, chips, etc., would be comparatively simple if the elements could be separated in the furnace, but this is impossible. Scrap of unknown analysis may not only mean waste or loss of the alloys, but may ruin an entire heat of steel. Properly classified scrap saves alloying materials as well as manufacturing time.

To make enough alloy steel for the demands of war, scrap must be segregated and identified by the specific classifications outlined by the War Production Board. The only way this job can be done is at the source—your machines where the scrap turnings are produced. If you have not already done so, we urge you to review your shop procedure on the handling of scrap.

COPPERWELD STEEL COMPANY ■ WARREN, OHIO

AIRCRAFT QUALITY STEELS · NITRALLOY STEELS
STAINLESS STEELS · BEARING QUALITY STEELS
CARBON TOOL STEELS · ALLOY TOOL STEELS

ARISTOLOY STEELS

"Know-How" Information, Continued

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☐ **48. COATED ABRASIVES** — Catalog. It is constructed to show the coated abrasives recommended for various industries, —wood working, metal working, plastics, tanning, etc., with section devoted to belts, bands, cones, discs, sheets, etc. Armour Sandpaper Works.

☐ **49. ALL ANGLE VISE**—Circular covers all-angle device, with exclusive drivwheel movement, double sivel construction, right angle clearance, and positive horizontal setting. Berco Mfg. Co.

☐ **50. HYDRAULIC CYLINDERS**—32-page catalog gives information on all Hanna hydraulic cylinders in such detail that one can quickly select the exact cylinder for a specific application. Describes them in detail with data on cushioning and hand-operated and foot operated valves. Hanna Engineering Works.

☐ **51. CURVED PLYWOOD, Flexible Bag Molding**—Booklet describes special properties required of adhesives, and methods of applying flexible pressure to molded plywood, and principal molding methods, types, of molds, etc. Resinous Products & Chemical Co.

☐ **52. STENCILS, Cutting** — Marsh Stencil Machine is said to make possible savings of $10 to $50 per month according to descriptive matter. Inexperienced help find it easy to operate. Available in 3 sizes— ½", ¾" and 1" to meet government specifications. Marsh Stencil Machine Co.

☐ **53. BRONZE BEARINGS** — stock list gives data on Selflube Porous Bronze Bearings, quantities, sizes, code numbers. Bearings are ready for installation. Maintained tolerances are .001" on I.D. and O.D. for each inch, plus .005 on length per inch. Keystone Carbon Co.

☐ **60. UNIVERSAL Slotmaster** is described in four-page catalog which shows some of the ways in may be used to save tools and setups, and gives description of tooling for cutting internal gear, chuck jaw teeth and feed cams, broaching splines, lapping deep impression dies, etc. Experimental Tool & Die Co.

☐ **54. SCREWS—Something New**—Clutch Head Screws with recessed heads operate with standard type screwdriver, or with assembly kit. Catalog details wide range of head designs in which they are available. Can be furnished with thread forming feature. United Screw & Bolt Corp.

☐ **55. RADIANT HEAT DRYING Lamps**—12-page booklet tells what radiant heat is and discusses its advantages for drying, baking and heating processes. Contains specific data on the three general classes of applications for industrial purposes. Westinghouse Lamp Division.

☐ **56. FINISHING MACHINE**—New bulletin describes cylindrical grinding, polishing, and buffing machines. Gives information for faster, better finishing of ¼" to 9" outside diameter tubes, rods, bars and wide variety of cylindrical shapes. Hammond Machinery Builders.

☐ **57. INDUCTION MOTORS** — Squirrel cage induction polyphase motors, 1/6 to 600 HP, in five different kinds of construction, are described in catalog section. Century Electric Co.

☐ **58. BOILER FEED WATER Conditioning and Chemistry**—This is new publication which deals with most common processes, softening processes, removal of gases, etc., and technical section on anlyses and data on chemicals. Cochrane Corp.

☐ **59. MARKER for Rods & Bars**—Bulletin described machine that will mark any metal in a wide variety of shapes, clearly, quickly and permanently. Large size bars of hard metals may be marked on one or two sizes at rate of 3,000 ft. per hour. Parker Appliance Co.

☐ **61. SHEAVES, Quick, Detachable, for Multiple V-Belt Drives**—New bulletin describes Pyott QD Sheaves which can be removed with socket wrench in minutes. Gives complete information as to stocks sizes, grooves, dimensions, prices, etc. Pyott Foundry & Machine Co.

☐ **62. HEAVY DUTY SURFACE GRINDER** —Bulletin describes heavy duty precision surface grinders which are manufactured in both the vertical spindle and horizontal spindle designs. Table sizes 18", 24", 30", 36", and wider, 5 ft. to 20 ft. long. The Hill Acme Co.

☐ **63. BRAKE LINING, Automotive**—Catalog contains recent and complete size and number data on roll and heavy duty block linings as well as multiple coverage segments for both internal and external applications. Listings are arranged by make and model and include sizes for every truck, trailer, tractor and passenger car and many types of industrial equipment. Grizzly Mfg. Co.

☐ **64. FREIGHT ELEVATORS** — Hydraulic. Folder illustrates and describes hydraulic freight elevators, floor to floor, or less than floor height known as ramp eliminators for feeding metal or paper sheets to presses, etc. Revolator Co.

☐ **65. MAGNETIC SEPARATORS** — Magnetic Type "QS" screen filter separator is described in new bulletin issued by The Stearns Magnetic Mfg. Co.

☐ **66. LEATHER BELTING Conservation**—Booklet deals with selection, installation and maintenance of leather belts, methods for aligning shafting, etc., cleaning and dressing belts, h.p. rating for oak-tanned flat belts, and other data. Baldwin Belting & Leather Co.

☐ **67. BEADING KNIT** for beading tube to Army-Navy specifications. Bulletin describes what is said to be quick, accurate, portable beading tool. Parker Appliance Co.

☐ **68. FLUORESCENT FIXTURE** Catalog—Describes new line of non-metallic reflectors, especially designed for industry; three sizes available for use as single units or in continuous rows. New line meets WPB requirements. Sylvania Electric Products.

☐ **69. WELDING CHART**—Contains all details relative to low temperature welding alloys in clear, brief, concise form—physical properties and procedure information. Eutectic Welding Alloys Co.

☐ **70. TALKING PICTURES, on Hand Tools,** their use and care—Complete series of six educational talking pictures, prepared under U. S. Army Ordnance supervision, available at cost. Cover practically all of the various types of hand tools in general use. Plomb Tool Co.

☐ **71. LIGHT WAVE Measurement**—Two-color, 12-page booklet contains charts, illustrations, diagrams, etc., and explains the practical everyday use of light waves in shop measurements. Acme Industrial Co.

☐ **72. DECIMAL CHART** — Handy chart gives at a glance the equivalent of fractions in four-point decimals. United States Rubber Co.

☐ **73. TEMPLATE DIES**—Bulletin describes process of manufacturing blank and pierce template dies. Process is said to save ¾ the time and 2/3 the cost of conventional dies. Algoma Products.

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Check each of page of "Know How"—10-12-14-16

Shock Loads Sabotage Wire Rope

{This is Number 15 in a series of informative articles on the conservation of wire rope. The previous article, Number 14, discussed the "Breaking-In Period" of wire rope. The present article endeavors to show how wire rope will last longer if shock loads are avoided after proper breaking in.}

* * *

LET'S AVOID SHOCK LOADS

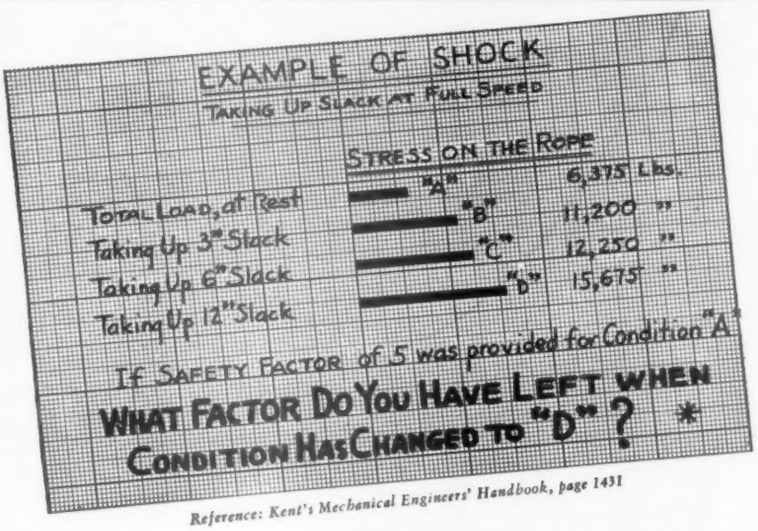
How simple things would be if there were no "ups and downs" in life. Take wire rope as an example. If operating conditions for your rope were always "peaches and cream"... if you didn't have to accelerate or speed up to meet performance expectations... if nothing went wrong to throw unexpected stresses on wire rope... if there weren't any "ifs," what a lot of unexplained things that now happen to wire rope we would never see.

But wire rope will continue to meet unexpected and unforeseen stresses. Knowing that, let's avoid *shock* loads that obviously overstress the rope.

WHAT ARE SHOCK LOADS?

Wire ropes are made to a specified catalog breaking strength. All hoisting equipment is designed with a predetermined line pull or load at drum for loads the equipment is made to handle. *Any load above the normal working load can develop a shock load.* And shock loads today are very definitely saboteurs of the war program.

Look, for example, at the chart. There you see what happens when a given load is applied suddenly to a slack rope. The given load (in this case 6,375 lbs.) remains the same BUT the sudden impact to the rope the second that slack is taken up creates a shock load that may exceed the rope's elastic limit. The result may not be an immediate break, but, because the rope is overstressed, it often fails on another operating shift, with another operator, who does not know about the overstressed condition of the rope. When the slack to be taken up is 12", for instance, the stress on the rope *at impact* is 15,675 lbs. . . . or more than twice the total load at rest.



Reference: Kent's Mechanical Engineers' Handbook, page 1431

ANSWER: *6,375 x 5 = 31,875 lbs. B.S.
31,875 ÷ 15,675 = 2.03 Factor of Safety

DOESN'T SAFETY FACTOR ABSORB SHOCK LOADS?

Safety factors for wire ropes vary with the type of equipment and use, as explained in article Number 4 of this series. Safety factors are based upon standard normal operations and cannot absorb the excessive shock loads, because these are beyond the normal working loads upon which the safety factor is figured.

HOW CAN YOU AVOID SHOCK LOADS?

1. Make sure there is no slack and no jerking of the rope at the start of loading.
2. Watch carefully the loads hoisted to see that they are not beyond the rope's proper working load.
3. Do not allow rope to become fouled or jammed either on the drum or by jumping a sheave.
4. Start load carefully—too fast acceleration overloads the rope. Watch how the rope "takes it" on the pick-up. Apply power smoothly and steadily.

OPERATOR ALL IMPORTANT!

Provided the equipment is in good condition and the correct rope is properly installed, the responsibility lies squarely on the operator to avoid shock loads. A good operator is a good rope's best friend, and when this friendship ceases, the rope might just as well be cut up with a torch or emery wheel. An operator can "make or break" a wire rope. There is no substitute for experience in handling rope and a desire to get the most out of it.

ALL 15 ARTICLES AVAILABLE ON REQUEST

For the benefit of those who want helpful information on how to conserve their wire rope, Macwhyte Company, its distributors, or mill depots will gladly send a set of all articles when requested on your letterhead.

MONARCH Whyte Strand PRE-FORMED WIRE ROPE

. . . Macwhyte premier wire rope, famous for its strength, toughness, and internal lubrication.

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WIRE ROPE

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Manufacturers of MACWHYTE PREformed and Internally Lubricated Wire Rope MONARCH WHYTE STRAND Wire Rope
MACWHYTE Special Traction Elevator Rope MACWHYTE Braided Wire Rope Slings MACWHYTE Aircraft Cables and Tie-Rods

"Know-How" Information, Continued

USE COUPON ON EACH PAGE

☐ **74. RECLAIMING CUTTERS** — Bulletin deals with reclaiming carbide tipped cutters and worn out HSS cutters, how to remove carbide tips, shank brazing, sandwich brazes, and brazing tips to multiple point cutters. Carboloy Co.

☐ **75. SLING CHAINS**—For simplifying sling chain orders, duplicate specification sheets for double and single sling chains show dimensions, fittings, etc. Forms are made in duplicate—one for the purchaser and one for the salesman. S. G. Taylor Chain Co.

☐ **76. PLANT BROADCASTING**—For paging calls, sending music into the plant, etc. Bulletin describes low-cost unit for small or medium sized industrial plants. Operadio Mfg. Co.

☐ **77. INDUSTRIAL OVENS**—Heat Treating and conditioning equipment, paint drying and baking ovens, core and mold ovens, and varied cabinet type ovens, are described in new catalog which also deals with construction and operation. The Lanly Co.

☐ **78. ROTARY FILES, RASPS & BURS**—Catalog shows hand cut rotary files, hand cut rotary rasps, milled cut rotary files, and burs, inside tube and combination inside-outside burring rotary files, special cutters and countersinks. Each of the hundreds of items is illustrated in actual size. Grobet File Co.

☐ **79. WET BELT MACHINING**—Brief book describes Precision "Wet Belt" Machining, and various types of Porter-Cable equipment for use on production line, in assembling department, tool room, maintenance, pattern and other departments. Porter-Cable Machine Co.

☐ **80. VALVES**—Bulletin contains complete dimension tables for butterfly valves, 15 to 125 psi. Features valves for regulation and shut-off duty for air, gas, steam, liquids and semi-solids—manual and automatic control. R. S. Products Corp.

☐ **81. PUNCHING AND NOTCHING Units**—Bulletin describes time-saving features, set-ups on T-slotted plates, template patters, and press brake rails. Wales-Strippit Corp.

☐ **82. COMPRESSORS**—Instruction Manual on maintenance, operation and care of compressors—portable, industrial, auto-air, and track-air. Davey Compressor Co.

☐ **83. COOLANT COOLER**—Bulletin describes coolant coolers of the shell and fin type, designed for use with water, brine, or direct expansion refrigerant. Can be furnished with brackets for floor, wall or ceiling mounting. Kramer Coolant Cooler, Kramer Trenton Co., Trenton 5, N. J.

☐ **84. VALVES, FITTINGS,** Accessories and flexible hose assemblies. New catalog supplement designed for the convenience of Purchasing, engineering, production and other departments, covers five lines of products. Each Weatherhead division is represented by a condensation of its regular catalog, in which products are listed for automotive, aviation, industrial, marine and refrigeration installations. The Weatherhead Co.

☐ **85. SHIPPING BOXES**—Heavy Duty Boxes, a new type of wirebound box for overseas and domestic shipments characterized as one of "the tools of war that will be tools of peace" are described in "General Box" which shows some of the packing methods approved and found satisfactory today. General Box Co.

☐ **86. GOVERNMENT SPECIFICATION FINISHES**—Service Catalog—Contains U. S. Army Air Corps specifications 14105-B—lacquer, cellulose nitrate, camouflage; 14106-A—dope, pigmented nitrate, camouflage; 3-163, lacquer for landing light reflectors; U. S. Navy Aeronautical, M-485-C, lacquer, non-specular; M-498,—dope cellulose nitrate, pigmented, non-specular; Army-Navy Aeronautical AN-TT-L-51—lacquer, cellulose nitrate; AN-TT-D-514—dope, cellulose nitrate, clear; AN-TT-4-551—dope, cellulose nitrate, clear, for aluminum dope; AN-TT-D-554, 556, AN-TT-P-656a superseding P-27-b. Supplementary pages will be furnished. Lacquer & Chemical Corp.

☐ **87. PLASTIC COATING FOR TANKS and Boilers**—Bulletin describes Serviron a permanently plastic material of the consistency of thick paint for protecting metal against corrosion, pitting, rust and fungus growth. May be used in hot water or cold water tanks, is not affected by feed water treatments; may be used to coat any kind of storage tank—metal, wood or concrete. Saverite Engineering Co.

☐ **88. SHEAVES** — Quick Detachable sheaves, which are said to be easy to get on and easy to get off are shown in new catalog which states they are accepted for all V-Drive applications, and gives data on interchangeable hub and rim combinations, list prices and stock sizes. Worthington Pump & Mchy. Co.

☐ **90. PERSONNEL Administration**—Records and Porcedure. Comprehensive manual deals with personnel management, administration, and illustrates wide variety of forms, including visible application forms, employment record, employment requisition, job speicfication card, physical application, identification, record, lost time and accident records, employee rating, training record, payroll records, and many others. Remington Rand.

☐ **91. PULLING TOOLS**—Bulletin explains and illustrates approved methods for removing and replacing gears, bearings, pulleys, sheaves, wheels, couplings, shafts and other closely fitted parts. Illustrations show various types of pullers, adaptors and attachments. Owatonna Tool Co.

☐ **92. BRASS FITTINGS**—Two-color wall chart is designed to help solve difficult fitting problems. It gives helpful data basic information which is valuable in familiarizing new employees with fittings. And it presents three methods of relieving wartime fitting shortages. Imperial Brass Mfg. Co.

☐ **93. NEW TYPE MOTORS**—Catalog describes revolutionary new idea in electric motor construction. For all types of motors the shell length, diameter, base mounting holes, shaft dimensions, etc., are exactly the same for any frame size. Motor meets all temperature guarantees inside and out. Bearings, ball and sleeve, are the trouble-free type. Line offers complete interchangeability of motor types. (Robbins & Myers, Inc.

☐ **94. APPRENTICE SCHOOL Training Manual**—To guide the training of students of the apprentice school, the B. F. Goodrich Co. has just published a 26-page manual outlining the various courses of study conducted by the school. The course of each study for each trade is given, both in the classroom and in the shop, and the number of hours required for each. Copy for the asking.

☐ **95. FILTERS** for keeping fluids clean. Catalog covers Auto-Klean—positive mechanical cleaning of the element, removing all kinds of solids from all kinds of fluids; and, Flo-Klean, positive hydraulic cleaning of the element and especially adapted for removing sand, metal chips, abrasive wheel particles, etc. from water, coolants, cutting oils, etc. Cuno Engineering Corp.

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Check each page of "Know How"—10-12-14-16

Here's how SKILSAW TOOLS BOOST PRODUCTION at LINDBERG ENGINEERING CO.

SKILSAW PORTABLE GRINDERS—Speed up all grinding, wire brushing, buffing and polishing on metal surfaces ... remove rust, scale, paint, etc.

ARMY E NAVY

Ask over at Lindberg Engineering Company ... and you'll hear plenty about the speed of SKILSAW TOOLS in turning out essential heat-treating equipment. Look around the Lindberg plants that fly the Army-Navy "E" ... and you'll see plenty of SKILSAW TOOLS in action ... speeding up countless drilling, sawing and surfacing operations!

Here's the reason! SKILSAW TOOLS are lighter, more compact, more powerful. They're *preferred* by workers and management alike because they *handle easier* ... do more jobs *better* ... and stand up *longer* under today's toughest conditions. Ask your distributor to prove it with a demonstration of SKILSAW TOOLS on your own work *today!*

SKILSAW, INC., 4761 Elston Ave., Chicago, Ill.

New York • Boston • Buffalo • Philadelphia • Cleveland • Detroit
Indianapolis • St. Louis • Kansas City • Atlanta • New Orleans
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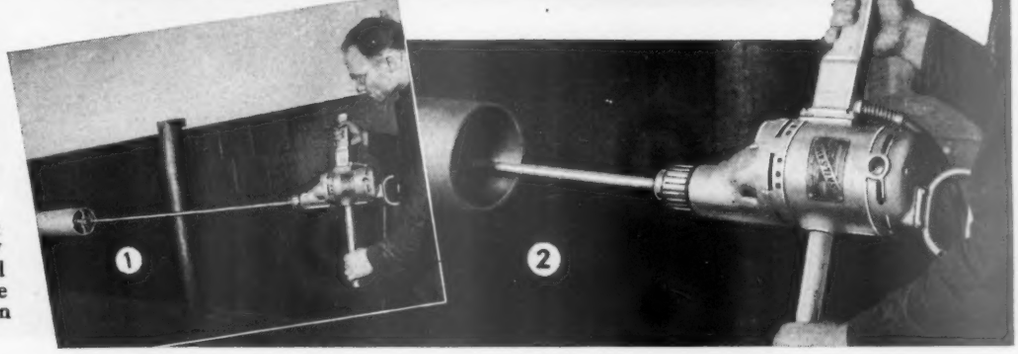
SKILSAW DISC SANDERS—For faster sanding on flat or curved surfaces of wood, metals, compositions. For grinding down raised welds, surfacing, preparing for finishes, buffing and polishing.

SKILSAW PORTABLE ELECTRIC TOOLS

★ MAKE AMERICA'S HANDS MORE PRODUCTIVE ★



1. With a special rig devised by Lindberg engineers, SKILSAW Model 123 DRILL hones the interior of this air-tight steel cylinder; replaces complicated hard-to-get machinery.

2. Honing rig on long shaft (smoothly driven by SKILSAW DRILL) is moved forward and back by operator, to produce the polished high precision surface necessary.

"-more planes than all

Speed on Sub-Assembly

At every step in plane production, from plans to final "gas and go," "See-ability," through better lighting, helps save time and materials.

the rest of the world"

"SEE-ABILITY" helps make them in the world's best-lighted plants

TODAY, the speed of the nation's aircraft production is amazing even ourselves. In this effort, "See-ability" is playing an important part. For through better lighting, men and women are working to closer limits, working with less fatigue, turning out better planes faster. All this calls for millions of Westinghouse Mazda Lamps, cuts deeper into the nation's supplies of nickel, copper, tungsten. That is why in plants everywhere, it is necessary that each lamp be made to provide the utmost in "See-ability."

How to Get More out of your Lamps

(1) Keep lamps and fixtures clean; (2) properly position all lighting; (3) check entire system. For additional suggestions see the new, illustrated 16-page brochure, "See-ability for Indoor Eyes," prepared by Westinghouse. Write for your copy today. Westinghouse Electric & Manufacturing Company, Bloomfield, N. J.

Westinghouse

MAZDA LAMPS

FOR GREATER "SEE-ABILITY"

for the Bridge of Ships

America's vast shipbuilding program calls for unprecedented quantities of high grade bronze castings. Bronze is the ideal alloy for the many ship parts which must resist corrosion or withstand high pressures — or both.

At the Howard bronze division, greatly expanded to meet today's need, a tremendous volume of bronze castings are being poured for use on ships of every type. Additional service is being provided for these cast parts by modern technique which increases the tensile strength of the metal.

Pressure castings for submarines are shown in the illustrations.

Bronze and brass castings for other armament applications are also being produced in great quantity, while at the two other Howard foundries an ever-growing volume of magnesium and aluminum castings is being turned out —all for the war effort. Together, these three foundries provide the largest jobbing production of nonferrous castings in America.

When you need nonferrous castings, call on Howard first.

For armament today—for utility tomorrow.

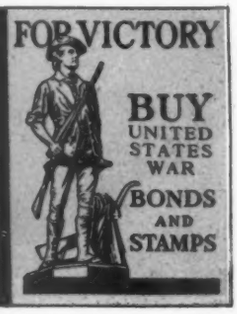
ARMY E NAVY

Howard Foundry Company
4900 Bloomingdale Road, Chicago

HOWARD

ALUMINUM · BRASS · BRONZE · MAGNESIUM

CASTINGS



Looking ahead with Asbestos

"Don't bother to answer, soldier. We know you've plenty on your mind—Japs, artillery fire, the next advance; urgent things like that. There's little time now to think about the materials that make your field telephone such an efficient piece of fighting equipment.

"But when the war is over, and you pick up that electrical engineering career again, you'll remember the things that served you well in the South Seas campaign; for instance, the K&M Ebonized Asbestos in your telephone kit."

Peace or war, K&M Ebonized Asbestos is an ideal electrical insulation for switchboards, panels, bus bar supports, testing tables, light switches. Being asbestos fibre, binding cement and insulating compound molded under tremendous pressure, it can absorb high voltages without puncture. Ebonized also withstands severe shock, vibration and temperature change.

Under the pressure of war, K&M has learned how to make its products *better* and *faster*. Constant research is leading to the development of many new and improved products for the future.

It is our belief that Industry will plan a way to use every bit of present research and "war-plus" production to meet the enormous needs of the "V" years ahead.

* * *

Nature made asbestos;
Keasbey & Mattison, America's asbestos pioneer,
has made it serve mankind . . . since 1873

KEASBEY & MATTISON

COMPANY, AMBLER, PENNSYLVANIA

Makers of

asbestos-cement shingles and wallboards; asbestos and magnesia insulations for pipes, boilers, furnaces; asbestos textiles; asbestos electrical materials; asbestos paper and millboard; asbestos marine insulations; asbestos acoustical material; asbestos packings; asbestos corrugated sheathing and flat lumbers; asbestos-cement pipe for water mains

Rawhide HAMMERS MALLETS

Carefully made, accurately balanced, with weighted heads where extra striking power is needed. Strike forceful blows without marring or battering, without recoil or bounce. Never split, chip, "smear" or crack, retain this true striking face so every blow goes right to the target . . . gets work done. Long wearing, mechanically cured, coiled Rawhide faces far outlast soft metals, plastics, wood or rubber.

Replaceable Heads

Replaceable Insert Faces are available for C/R Hammers . . . make each a "lifetime" tool.

C/R Hammers and Mallets are classified as *essential tools* for the manufacture and maintenance of aircraft and other military material.

Write for Catalog Sheets

CHICAGO Rawhide MFG. CO.
1284 ELSTON AVE. ★ CHICAGO, ILLINOIS.

F.O.B. filosofy of buying

VICTORY gardener on a large scale is Major George Cronin, Purchasing Agent for the Commonwealth of Massachusetts. The Major has a sizable commissary problem for the various institutions coming under his purchase jurisdiction, and with patriotic resourcefulness he initiated a growing and canning project at the State Farm to take care of the maintenance for which he is responsible. At the same time, he hoped to conserve a few ration points, for his charges do not have the easy alternative of dining out when the points run low. Enter the OPA, with the decision that the garden was a swell idea, but that the Major would have to surrender ration points for anything transferred to the other institutions. But the Major doesn't surrender easily. His military title was won on the battlefields of World War I, and his courage and common sense have earned him the enthusiastic endorsement of six governors, of varying political faiths, since Republican Governor Fuller first put Democratic Buyer Cronin on the job back in 1924. Watch Massachusetts for what may become an important test case in the food rationing program.

• •

As others see us: The Los Angeles *Commercial News* reports the election of Union Pacific's C. A. Keeble as President of the Los Angeles Purchasing Agents Association under the headline "Heads $1,000,000,000 Spenders Association."

• •

MAJOR General Levin H. Campbell, Chief of Ordnance, has issued a general order through the pages of *The Ordnance Sergeant*. "Whenever a member of the Ordnance Department, regardless of rank, encounters Red Tape in conducting our business," says the forthright General, "throw the Red Tape to hell out the window. If an abundance of paper work is involved in a matter of supply and maintenance, deliver first and fill out the forms when there's time. Accept that, please, as a definite general order." Industrial Purchasing Agents look hopefully toward their commanding officers in WPB, but hear no echo of that sweeping statement. Try to get delivery without filling out the forms first! Or just try to get delivery—period.

• •

Add to the list of obsolete business terms the P.A's designation as a "white collar worker". The laundry crisis has seen to that.

• •

PURCHASING Agents, who are professionally interested in values, and whose basic responsibility is value, may be pardoned for wondering at times what a Purchasing Agent himself is worth. Some light on the popular conception of this question may be gleaned from a recent announcement of examinations for the position of Assistant Purchasing Agent for a city of 85,000 people. Requirements for the job include graduation from an accredited college or university; at least 15 units of upper division work in business or public administration, purchasing or economics; one year of experience in purchasing work or two years of experience in stock and material control. The salary—$164 per month. Instances of this sort go far toward explaining the much-criticized calibre of some public purchasing, and the failure of this potentially important function of public administration to attract the interest more first-grade men. Not that a higher salary scale automatically makes a better buyer, but a rate of compensation reasonably commensurate with the skill and responsibility involved would certainly make available the services of more competent purchasing personnel and it would remove one of the potent sources of temptation which

have constantly besmirched the record of public buying despite the high standards and integrity of the leaders in this field. All too few are the cities in which the slogan of "businesslike administration of government" has been extended to include a businesslike salary scale. Where that principle has been tried, businesslike administration has a chance to succeed, and the results are eloquent in their record of buying efficiency to the great advantage of the citizenry. We wonder whether the personnel office from which this generous offer originated has had the same experience as many purchasing offices that have sent out bid invitations in recent months and have been obliged to report: "No bids."

• •

ONE phase of purchasing that industrialists have watched with growing concern is the trend to put all foreign trade into the channels of inter-Government deals. It is particularly reassuring, therefore, to read the public announcement of the Portuguese Purchasing and Trade Commission that its objective is to keep trade between the United States and Portugal in private channels. And that policy is substantiated by the record. Over the past year and a half, less than ¾ of 1% of the Commission's purchases here have been for its own account. More than 99% of the purchases have been in the nature of private shipments.

• •

The chief hardship about these pay-as-you-go tax deductions from the pay check is that as a nation we have been brought up on the play-as-you-go policy.

• •

THE nation may be pardoned for viewing the bonus and subsidy program with skeptical suspicion when adjoining columns of the morning newspapers report (1) an OPA plan for granting price premiums to new wells to encourage increased production of oil and (2) a Senate recommendation to grant a 33-cent price increase on corn "in the hope of getting on the market some of the 800,000,000 bushels held by farmers." So far the purchaser is the only one who has not been suggested as a beneficiary of subsidy payments to complete the cycle of production and distribution. Hold that line!

meet the CAP SCREW
Little Giant of Industry
True hexagon head, assuring solid wrench grip
Washer facing affords bearing surface making for perfect fit
Uniformly round shank free from roughness and imperfection
Well-defined clean threads, without burrs, and made to standard tolerances
Chamfered point for easy, fast assembly

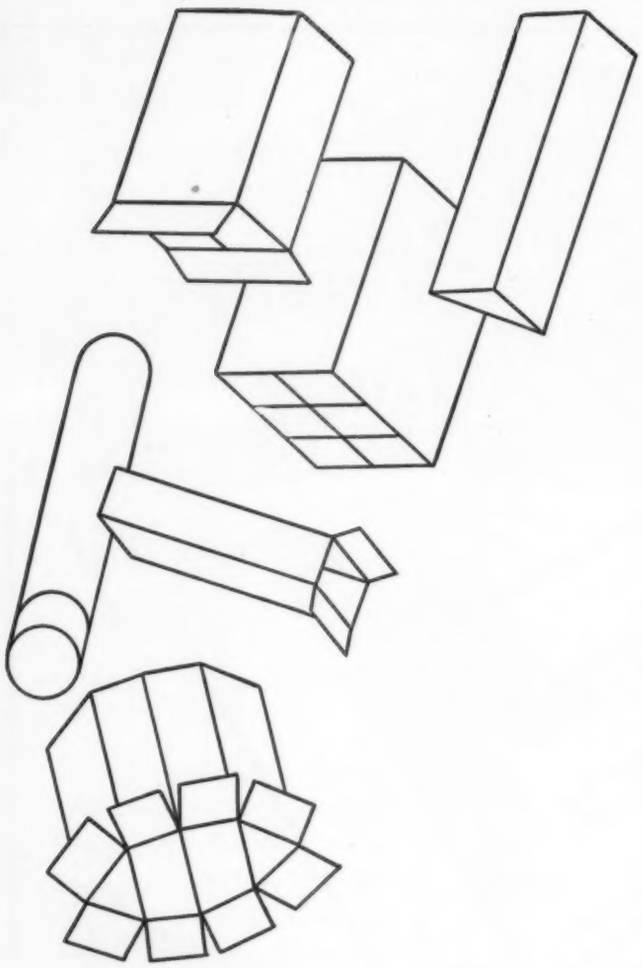
The cap screw—little giant of industry—is the Joe Doakes of metal fastenings. The cap screw is on the job, holding parts together in tight spots, under strain, in important applications, under all conditions.

General cap screws made in all head styles, are used with day-to-day and year-by-year satisfaction by hundreds of companies in scores of diversified industries.

In addition to a complete line of cap screws, we manufacture: machine bolts, carriage bolts, machine screws, hexagon and square tapped nuts, step bolts. We are well equipped to serve defense industries on the basis of their importance to the war effort. Our complete facilities and manufacturing skill in standard and special items in all types of metal, are at your disposal.

GENERAL SCREW Manufacturing Company

1238 W. Monroe St., Chicago 7, Ill., U. S. A.

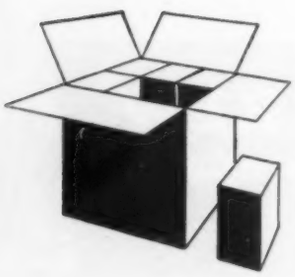


PAPERBOARD PACKS THE ALLIES' PUNCH!

• From minute parts to giant bomber noses and heavy assemblies, thousands of war products today travel in specially designed paperboard packages . . . from sub to prime contractor, from plant to plant, from supplier to military depot—and even to the fighting fronts.

• For nearly three years, Container Corporation has worked with various Government agencies in the development and supply of these war packages—built to save time, space and materials, to cut out waste and damage. Many are illustrated in our booklet, "Paperboard Goes to War," that we offer without cost to all present or prospective war contractors.

• Call or write our nearest office for a copy —and arrange a discussion with one of our packaging engineers.



CONTAINER CORPORATION OF AMERICA

General Offices: 111 W. Washington St., Chicago • New York • Rochester • Natick, Mass. • Philadelphia
Akron • Cincinnati • Cleveland • Circleville • Detroit • Indianapolis • Wabash • Carthage • Anderson, Ind.
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EVERYTHING PAPERBOARD FOR EVERYTHING PACKED

ABRASIVE COMPANY

Victory Points

WITH DEMOUNTABLE SPINDLES

PATENT PENDING
★ ★ ★

Save Steel . . . for War Production

If you use Mounted Wheels and Mounted Points . . . switch to Abrasive Company new VICTORY POINTS . . . and save critical steel for war production! Their demountable, replaceable spindles permit quicker changing and greater convenience and more accurate work, since the spindle cannot pull loose, twist or turn.

For complete information about this outstanding new development write for our new bulletin on VICTORY POINTS, Form ESA-65.

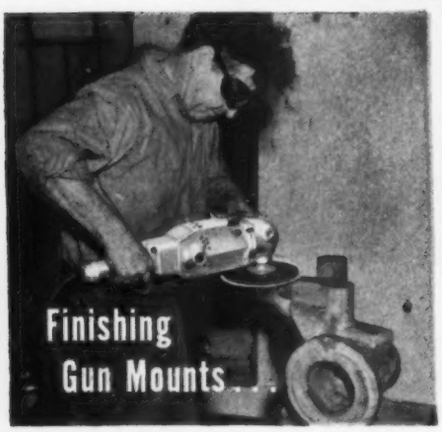
ABRASIVE COMPANY

DIVISION OF SIMONDS SAW AND STEEL CO.

TACONY & FRALEY STS., PHILADELPHIA, PA. • DISTRIBUTORS IN ALL PRINCIPAL CITIES

"..Black & Decker Tools help speed Vital War Production & maintain shop equipment,"

SAYS PLANT SUPERINTENDENT



"We've used Black & Decker Tools almost exclusively during the plant's lifetime. They are sturdy tools, take a terrible beating...but never break down."

THIS comment, from the superintendent of an eastern machine shop's assembly and fabricating department, reflects typical reports from men who know and use Black & Decker Portable Electric Tools. This particular plant is presently engaged in vital war production . . . uses Black & Decker Heavy Duty Sanders in the finishing of parts and assemblies for the naval program . . . keeps other production equipment in top running condition with the help of B & D Drills and Bench Grinders.

Throughout war industry, husky Black & Decker Tools are helping speed vital production jobs such as these . . . helping maintain other production equipment equally as vital. And, sometimes when production "bottlenecks" or unavailable equipment have threatened to choke off the weapons America needs, ingenious war producers have combined experience and brains with these tools to perform new, unprecedented war jobs . . . "to turn out the goods faster and better."

Our New, Illustrated Booklet, *"They Used Their Heads," describes instances of America's system of free enterprise at work . . . of close cooperation between production experts and the men who supply them. Write for your copy. The Black & Decker Mfg. Co., 764 Pennsylvania Ave., Towson-4, Md.*

LEADING DISTRIBUTORS EVERYWHERE SELL

Black & Decker

PORTABLE ELECTRIC TOOLS

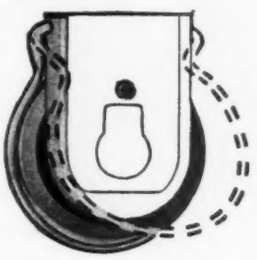
BUY THE FLUORESCENT LIGHTING WITH THIS *EXTRA* SAFETY FEATURE!

TAKE a good look at the little sketch below. It shows an exclusive feature of MILLER *AERO-DESIGNED* fluorescent lighting — a patented safety lamp lock that minimizes the danger of lamps falling.

It's a very important feature to any man investing in fluorescent lighting today.

This patented safety lamp lock is an integral part of each socket, simple in operation and foolproof. It's a MILLER "extra" — and your protection against costly plant accidents.

Other noteworthy features of MILLER *AERO-DESIGNED* fluorescent are itemized below. Check them carefully, then call in a MILLER field engineer (located in principal cities) for a talk about *your* plant lighting.



Here's the rugged new MILLER AERO-DESIGNED fluorescent fixture — available in individual units, or for continuous-row lighting.

CHECK THESE MILLER FEATURES

REFLECTORS are of Masonite with durable IVANITE, the "sealed-in-surface" finish for high reflection factor. Lightweight, easy to remove, simple to clean. Reflectors are "extra length" for good shielding of lamp ends. Miller reinforcing reflector attachment strap assembly is an integral part of each reflector—no change required for either two or three-light units.

WIRING CHANNELS, now streamlined, contain all necessary wiring and auxiliaries—with ballasts exposed for heat dissipation. Can be used as individual lighting units or in continuous rows.

FLANGED TOP of channel permits clamp strap attachment at various points along channel, for ceiling, rod or cable mounting to suit any ceiling structure. Also can be suspended with chains, conduit or combinations of these methods.

MILLER SAFETY SOCKETS with integral safety lock to prevent lamps from falling are rigidly spaced and substantially mounted.

FIXTURES carry both Underwriters' and RLM Standards labels — are backed by written warranty and MILLER'S almost 100 years of lighting experience.

THE MILLER COMPANY • MERIDEN, CONNECTICUT

ILLUMINATING DIVISION
Fluorescent, Incandescent
Mercury Lighting Equipment

OIL GOODS DIVISION
Domestic Oil Burners
and Liquid Fuel Devices

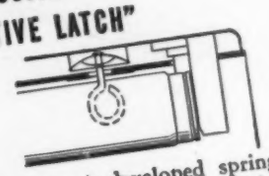
ROLLING MILL DIVISION
Phosphor Bronze and Brass
in Sheets, Strips and Rolls

WAR CONTRACTS DIVISION
War Materiel

MILLER
SINCE 1844

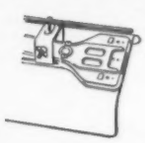
SYLVANIA *Challenges*

EXCLUSIVE "CAPTIVE LATCH"



This Sylvania-developed spring-type fastener saves installation and maintenance man-hours. It stays put while lamp is in service despite any kind of vibration. It locks or unlocks with a simple quarter turn. No tools are necessary.

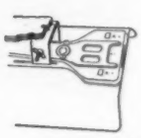
HANG IT ANY WAY YOU WANT



slide-grip hanger

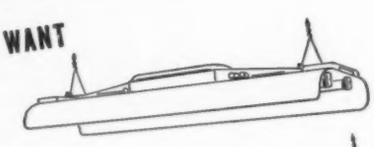
chain mounting

stem mounting

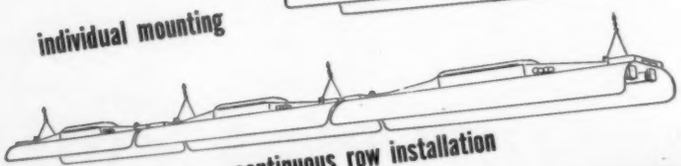


surface mounting

AND HOWEVER YOU WANT



individual mounting



continuous row installation

MORE LIGHT FROM LESS WEIGHT

Sylvania pioneered composition reflectors for fluorescent fixtures and "proved them in industry."

This composition reflector has an efficiency of 86 per cent — even higher than that of prewar porcelain-enameled metal in conventional contours.

It is fabricated to Sylvania's specifications from a strong and durable composition. Coated with MIRACOAT inside and a handsome French Gray outside, it stands up under extreme humidity and temperature conditions.

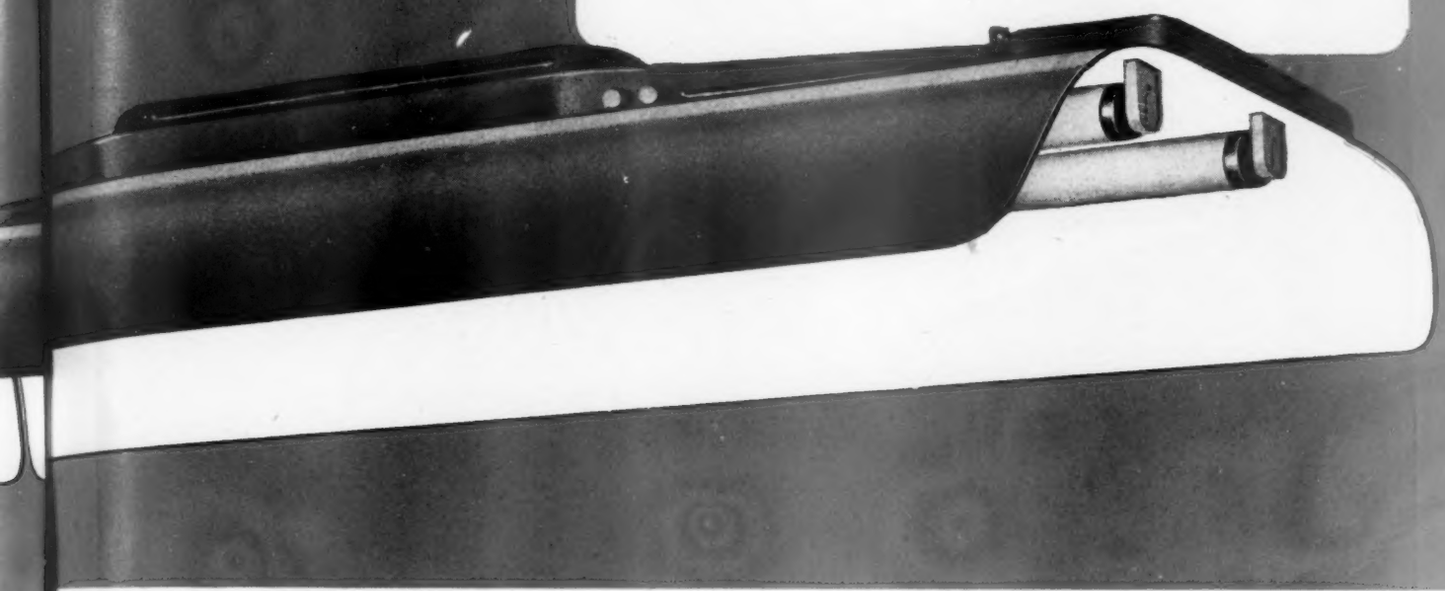
- ✓ Impervious to frequent washings.
- ✓ Gives more light.
- ✓ Lighter and easier to handle.

INCANDESCENT LAMPS, FLUORESCENT LAMPS, FIXTURES AND

Comparison

Check these points of Superiority

- ✓ Easier installation
- ✓ Speedier maintenance
- ✓ Cantilever construction
- ✓ Simple design
- ✓ Standard interchangeable parts
- ✓ Enclosed ballasts
- ✓ Single or continuous row hanging



The Fixture of the Future against the field

• Compare the design and construction of the Sylvania Fixture of the Future with any other fixture now available, and it wins hands down.

It is much more than a design to eliminate the metallic reflector and cut down top-housing weight to the three-pound requirement. Sylvania engineers attained a new standard of perfection, far ahead of its time.

A revelation of simplicity, this new Sylvania fixture is available in both 100-watt and 40-watt lamp size. In either length, *one* standard fixture fills any and all industrial lighting assignments.

Unparalleled in adaptability, it may be installed individually or in continuous rows. It is fitted with knock-outs for any practical mounting. The optional number of lamps in the regular 40-watt size gives new flexibility in meeting varying foot-candle requirements.

The streamlined top-housing, constructed like a cantilever bridge, encloses the ballast — protects it from dust — provides cooler performance. The starter sockets are honestly accessible — inset from the side to avoid dust, dirt and moisture. Pull-chain switch is optional.

The Sylvania Fixture of the Future carries Underwriters' Laboratories approval and our own standard guarantee. For specifications and prices, write Dept. EW-8, Sylvania, Ipswich, Mass.

"Everything that's Finest in Fluorescent"

★ ★ **SYLVANIA** ELECTRIC PRODUCTS INC.

LIGHTING DIVISION, IPSWICH, MASS.

AND ACCESSORIES, RADIO TUBES, ELECTRONIC DEVICES

HE'S CALLED "MIRACLE MAN"

SMOKE from stacks in a score of great plants etch his name against the industrial sky. He's a production wizard who refuses to tolerate the word "impossible." But he'll admit proudly that his achievements are the result of organizing and coordinating the talents of others.

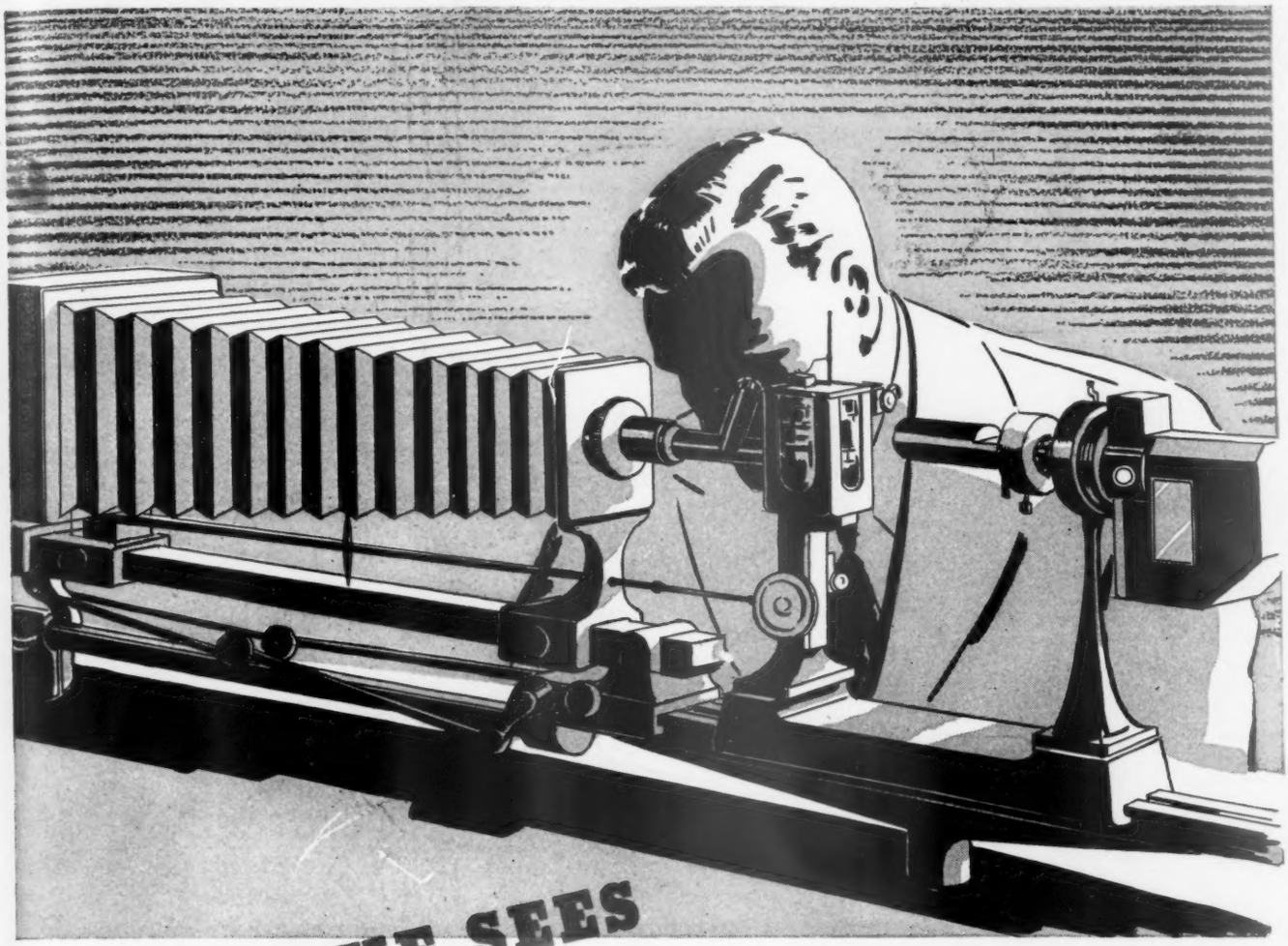
In one of his plants, for instance, the chances are you would find parts, assemblies and machines of precision workmanship by Joyce, writing new records in speed and precision. For another plant, Joyce may be producing and assembling vital and integral parts of these weapons of war—parts where hairline precision can mean the difference between success or failure.

Joyce designing and engineering skill is helping to achieve production miracles in many great industrial plants from coast to coast. And Joyce's own large-scale production facilities are maintaining a steady stream of war material for our fighting forces—covering a wide and constantly varying range of machined and fabricated parts and products.

If you face production problems in your business—either for war work or post-war production—the Joyce "know how" is at your service. A Joyce representative will be glad to call and explain in detail the unique advantages we offer.

BEHIND THE MAN ▸ BEHIND THE MAN ▸ BEHIND THE GUN

JOYCE
Machine Company
WHEATSHEAF LANE • PHILADELPHIA
MANUFACTURERS OF PRECISION PARTS
FOR ALL KEY INDUSTRIES



WHAT HE SEES

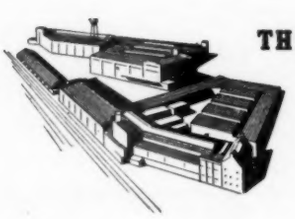
may shape your future!

While Van Dorn production is 100% on war work, Van Dorn technicians have an eye on the future—the future of postwar products.

Through our armor plate production for aircraft, tanks and guns, these technicians are gaining a vast knowledge about the many new war-born metals and the latest developments in metal fabrication. What's more, they are expertly equipped to determine what these war discoveries will mean to you in peacetime.

These Van Dorn engineers are heat treating, welding and machining specialists. They have the benefit of our background of 65 years of metal fabricating service to industry. They have access to our modern and extensive heat treating, welding and machining facilities, among the finest in industry. With all this, they have been able to build a storehouse of new factual engineering data to pass on to you for use in developing your products of the future.

We'll be glad to have a Van Dorn engineer call and explain our service to you, or work with your production men on plans for better welded, better heat treated or better machined metal products for tomorrow. His service costs you nothing, obligates you in no way. Write today.



THE VAN DORN IRON WORKS COMPANY • CLEVELAND, O.

SPECIALISTS IN METAL FABRICATION AND HEAT TREATMENT SINCE 1878

Exploding old assembly methods..

with the Speed Nut System

The spring tension principle of the SPEED NUT SYSTEM has revolutionized assembly methods everywhere. Now, in many cases, one SPEED NUT performs multiple functions, reduces number of parts, eliminates handling operations and drastically cuts weight and production costs.

For example: Our complete line of SPEED NUT angles combines the angle bracket and fastener into a single part. Self-retaining SPEED NUTS for all types of conduit clamps speed up assembly by eliminating unnecessary handling of parts. SPEED NUT retainer rings cut riveting operations to a minimum and save both in material and weight. SPEED NUT strips replace extruded gang channels. And our triangular nut plate for attachment of running lights, cuts riveting operations from 6 to 1. These are only 5 out of dozens of SPEED NUT designs that have virtually exploded conventional assembly methods. Write for our new summary catalog No. 185.

TINNERMAN PRODUCTS INC. • 2050 **Fulton Rd., Cleveland, Ohio**

IN CANADA: Wallace Barnes Co., Ltd., Hamilton, Ontario

IN ENGLAND: Simmonds Aerocessories, Ltd., London

Speed Nuts — **FASTEST THING IN FASTENINGS!**

IF IT'S PIPING CONTACT FLORI

Warships or merchantmen—their arteries are pipe.

We make anything in tubular or plate steel fabrication: Fabricated Piping — for steam, water, air, oil, gas, chemicals • Random mill or cut lengths, bent, coiled, welded, flanged, threaded • Valves, Pipe Fittings.

Send us your inquiries.

FLORI PIPING

THE FLORI PIPE COMPANY • ST. LOUIS—CHICAGO

HERE it is, ready for you. Twenty pages of tool-saving, time-saving, tool-crib arrangements used in many of the nation's busiest plants — who have problems like yours. Faced with a shortage of small tools, many plant managers have found that careful tool crib planning means more effective use of the tools they have. This book shows how they do it. This is not a book of theory — every photograph in it shows how a real plant has made a real saving. "Greenfield" wants you to have a copy, as part of our contribution to the united effort. Send your reservation today . . . use the coupon below.

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GTD GREENFIELD
TOOL CONSERVATION Begins in the Tool Crib
PRACTICAL TOOL CRIB ARRANGEMENTS
which are helping today's busy plants make the most of the Tools they have

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Gentlemen: Kindly send me a copy of your 20-page booklet "Tool Conservation Begins in the Tool Crib."

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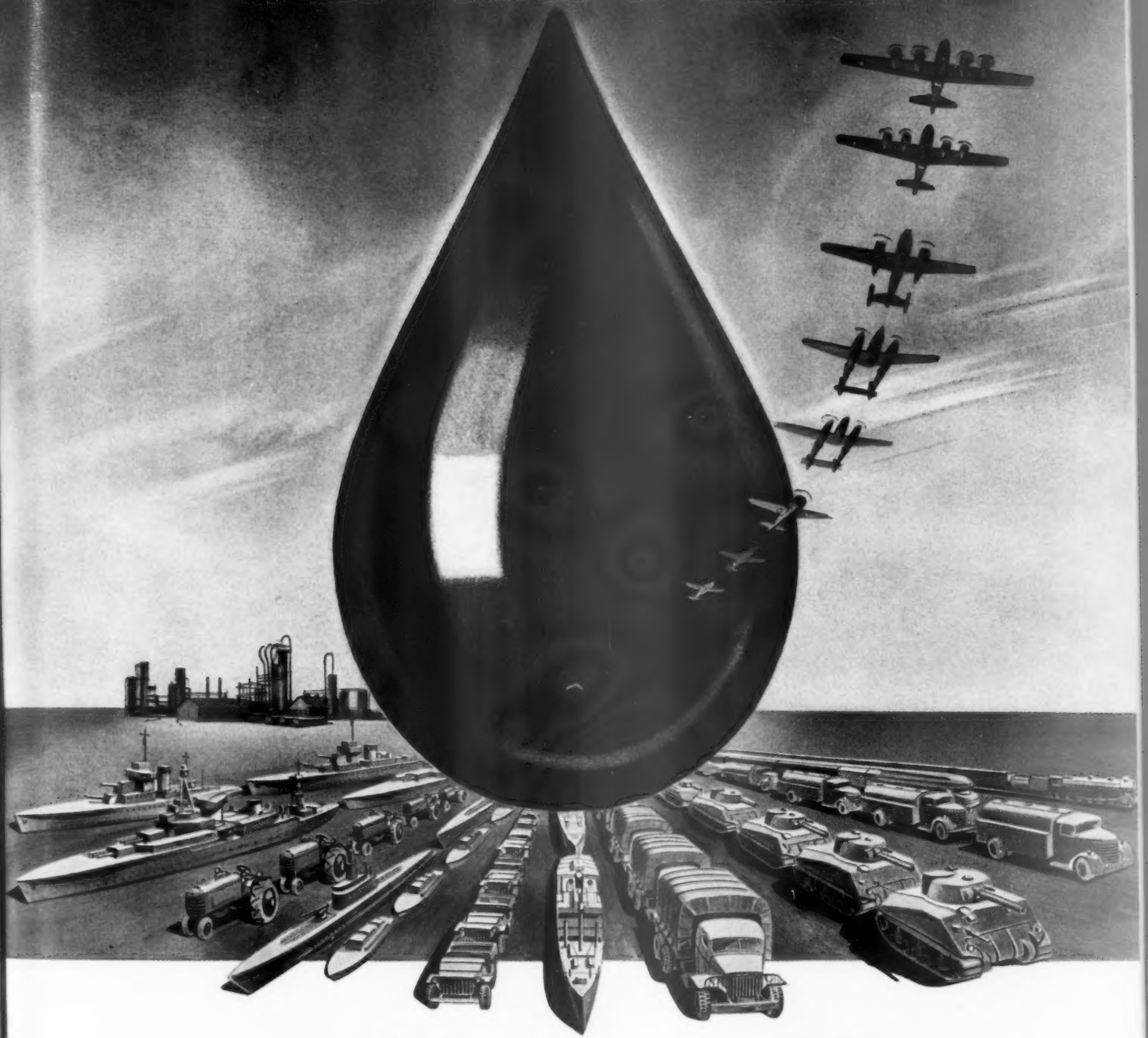
MOBILITY
is the FORCE of America



... and Mobility depends on OIL!

"*Going* places and *doing* things" is more than a slang expression . . . it is the force, the vitality, the very life of America. It is our greatest strength . . . and now our most potential weakness!

Figure it out for yourself:

Mobility . . . the capacity to move about . . . to get from here to there, and *fast* . . . is the one characteristic which, in greater degree than any other, distinguishes *us* from all *other* nations on earth! It was the foundation of our past; it is our present *salvation;* it will be our future power.

And . . . don't deceive yourself . . . mobility depends on *oil.* When America's oil wells cease to flow, America's mobility *ceases to exist.* Trains, trucks, planes, ships, tanks, automobiles and other vehicles will *stop* and *stay stopped* for lack of *fuel* and *lubrication.*

Oil producers have done and are doing a magnificent job . . . on a comparative "shoestring" of manpower, equipment, supplies, and incentives. But their effort is limited by inability to get rig equipment, pipe, and tools . . . for exploration of new fields and maximum production from known fields. As a result . . . oil reserves are shrinking; wildcatting has been seriously retarded. This dangerous situation needs immediate, thoughtful consideration. America must not be *im*mobilized for lack of *oil!*

PITTSBURGH STEEL COMPANY

Grant Building Pittsburgh, Pa.

SERVING THE PRODUCING AND REFINING INDUSTRIES WITH DRILL PIPE, CASING, OIL WELL TUBING, REFINERY PIPING

The better the fit of cap and set screws *the faster your assembly*

...Try CLEVELAND "Class 3 Fit" screw products

● Quick easy handling of threaded fastenings in your assembly calls for uniformly accurate threads. Class 3 fit in Cleveland products is assured by our specialized plant and personnel *plus* the strength-adding Kaufman Process of cold heading manufacture.

Bright full finished cap screws in all styles and sizes, including extra large diameters. Also SAE 1035 heat treated and special alloy screws. Set screws and "specials".

THE CLEVELAND CAP SCREW COMPANY
2917 East 79th Street • Cleveland, Ohio

Cleveland Cap Screws

Set Screws and Special Upset Parts

Made by the Originators of the Kaufman Process for Greater Strength and Accuracy

Specialists for 26 years in Headed and Threaded Products

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ARMY E NAVY

Back to the Scrap Pile!

Proudly we fly the Army and Navy "E" flag and stars, awarded and re-awarded for excellence and proficiency in the production of war materiel.

Kropp Forge Company

Makers of Drop, Upset and Hammer Forgings for Ships, Guns, Planes, Tanks, Ordnance and Machine Tools.

"World's Largest Job Forging Shop"

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Chicago, Ill.

Engineering Representatives in Principal Cities

SERVING INDUSTRY SINCE 18 31 OVER 100 YEARS
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KROPP FORGE CO.

In no other arm has greater advancement been made since 1918 than in anti-aircraft guns, which were lightly regarded by flying men previous to this war. These guns, which are knocking many enemy planes out of the skies today, are much more accurate, higher-ranged and far more deadly. Here, again, improvement has been achieved to a large extent through the broader use of better materials, including tough forgings for the parts of gun and mount which must withstand the most severe stresses and impacts.

At Kropp Forge, we are turning out an endless volume of super-tough forged parts for modern anti-aircraft guns, as well as for other ordnance, tanks, planes, ships and essential war machinery. Recent plant expansion gives us the ability as well as the will to produce even more forgings for the war effort.

The inquiries of armament and war machine makers are solicited.

KROPP

WAGNER PRODUCTS SPEED VICTORY!

THOROUGH INSULATION

IS ONLY ONE OF THE MANY REASONS WHY

Wagner MOTORS

Stay on the job!

All Wagner motors are built to exacting specifications, and embody characteristics and features that give them long life, dependability and added protection against failure. Wagner engineers will not compromise on "good enough" insulation — all windings must be thoroughly insulated. This is only one of the many reasons why Wagner motors stay on the job.

The illustrations on this page show typical polyphase stator windings. The stator cores of all Wagner polyphase motors are well insulated, using special slot cells formed from tough fibrous material, cuffed on each end for extra strength. The coils and free ends are shaped to fit snugly into the slots so that there is no possibility of vibration and at the same time the windings are easily put into place. Heavy separators are used between the coils in the slot and inverted U-shaped cells fit over the tops of the coils under the slot wedges. The free ends of the windings are completely taped well into the slot cells, and heavy sheets of black varnished muslin are slipped between the coils of the various phases to insulate them from each other.

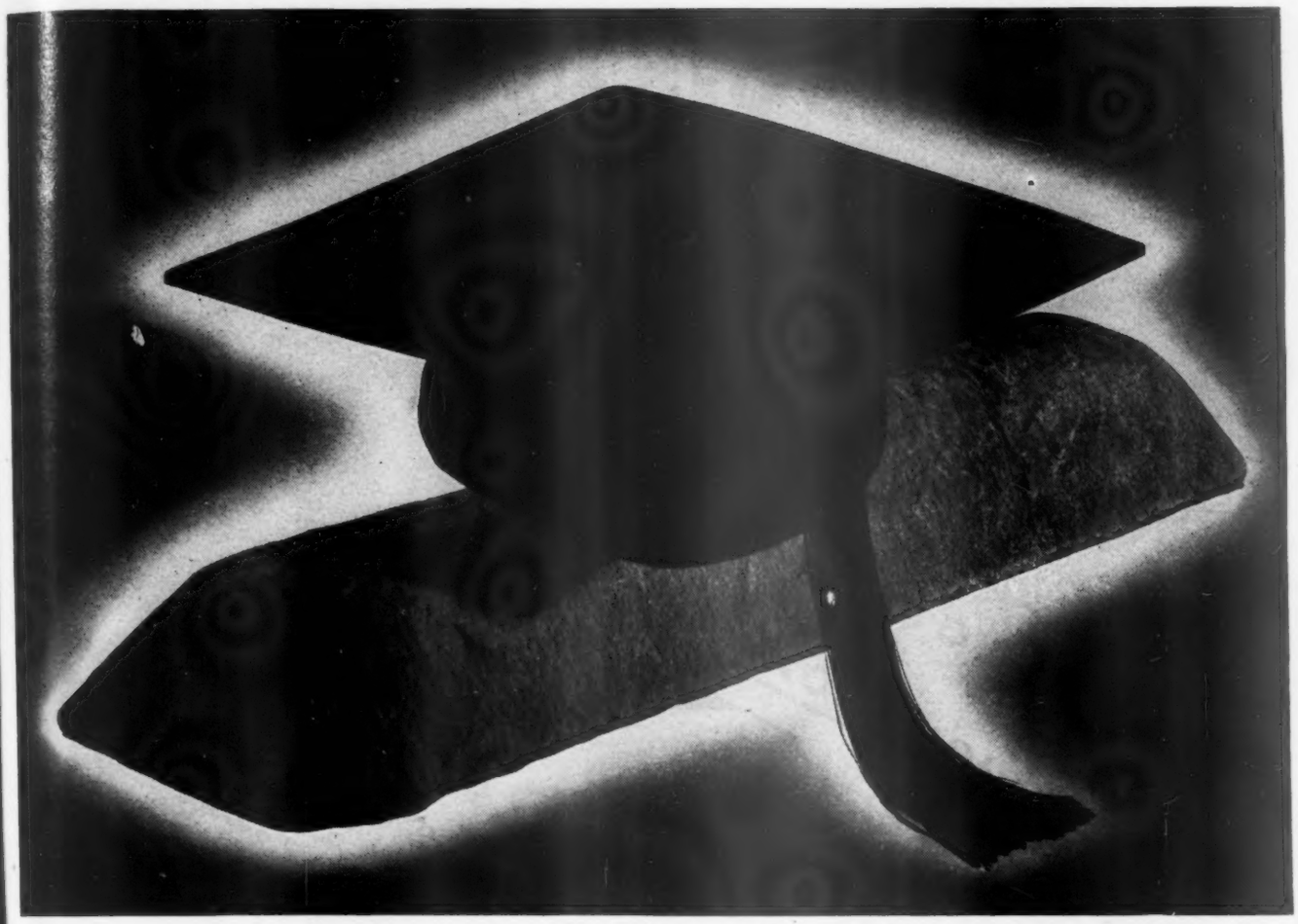
After the windings are in place, the stator is baked to remove all moisture, and while still hot it is immersed in a heavy insulating varnish. When the heated stator core is immersed in the much cooler varnish a suction is created which produces complete impregnation of the windings. The stator is immersed long enough so that the insulating varnish impregnates the innermost portions of the coils. The stator is then baked again until this coating is completely dried. It is then given another dipping and baking to insure complete impregnation and to provide an added moisture-resisting coating. Finally, the stator is sprayed with air-drying varnish, which not only provides further resistance to oil and moisture, but also gives the coils a glossy surface.

M43-13

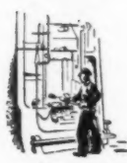
WRITE FOR COMPLETE INFORMATION

Complete information on Wagner motors will be sent upon request. Wagner is a nation-wide organization with branches in twenty-nine principal cities. Each branch office is manned by trained field engineers ready to help you solve your motor-drive problems.

Wagner Electric Corporation
ESTABLISHED 1891
6360 Plymouth Avenue, St. Louis, 14, Mo., U.S.A.
ELECTRICAL AND AUTOMOTIVE PRODUCTS



THIS LITTLE PIG WENT TO SCHOOL!



Today it's just a hunk of iron . . . Its possibilities are practically unlimited, but, like all of us, it must be educated before it is worth much to civilization. It can become a simple grey iron casting — a steel casting — a rolled steel bar — and so on, its ultimate value depending upon how far this educational process is carried.

Drop forging provides an added step — a post graduate course — a finishing school. In forging a machine part, for instance, the entire structural make-up of the metal is changed as the part is being formed. Added tensile, torsional, and impact strength is obtained through controlled grain flow and metal distribution.

Forgings by Phoenix demonstrate most forcefully the value of this educational process. In gears, machine tool parts, and hundreds of other items, they insure extra endurance, longer life, greater efficiency, and often at a lower cost than that of castings.

Today, Uncle Sam is our customer. Tomorrow — as in the past — Forgings by Phoenix will contribute to the even greater efficiency of a peacetime world. In your plans for a post-war market, consult Phoenix. Our engineers will gladly discuss your problems with you without obligation.

Forgings by **PHOENIX**

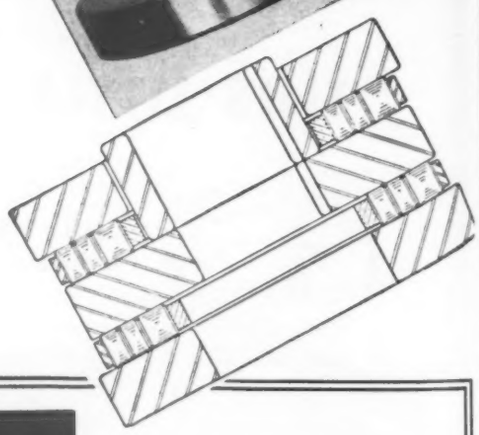
PHOENIX MANUFACTURING COMPANY
DEPT. 5, CATASAUQUA, PENNSYLVANIA

Especially for **THRUST** *Bearings . . .*

ROLLWAY'S

Right Angled LOADING *is the* RIGHT LOADING

The speed, oscillation, direction and repetition of stresses are as important as total stress magnitudes, when it comes to designing anti-friction bearings. Even the smallest of thrust stresses—if applied often enough to a bearing already carrying a radial load—will cause failure or excessive wear on the bearing race. That's why it's important not to lump thrust loads onto bearings designed for radial stresses.



Rollway's Right-Angled Loading Gives Thrust Bearings Higher Capacity and Longer Life

By loading all bearings at right angles to the roller axis, Rollway splits compound loads into two simple components. Thrust bearings carry only pure thrust. Radial bearings carry only pure radial. Result is an increase in life expectancy for both bearings, plus greatly increased carrying capacity for either load in a given dimensional limit. Oblique resultants that bedevil stress analyses are banished. You get more careful engineering of the bearing to the job, more economical use and distribution of materials in the structure of the machine.

For longer bearing life, more efficient performance and more economical maintenance . . .

FOLLOW THIS BASIC BEARING PRINCIPLE

- All radial loads carried at right angles to the roller axis.
- All thrust loads carried at right angles to the roller axis.

- A wide range of types in SAE and Americn Standard Metric Sizes are available for most requirements, eliminating the cost and delay of special patterns and tools. Let Rollway "know how" aid you in a proper choice.

ROLLWAY BEARING COMPANY, INC., SYRACUSE, NEW YORK

BUILDING HEAVY-DUTY BEARINGS SINCE 1908 **BEARINGS**

1st Birthday of the M-7
It's the "tank-killer" that helped turn the tide at El Alamein...and the British 8th Army and a whale of a lot of Americans deserve credit for what it did!
It was built without a blueprint just one year ago. It was asked for in three months—and completed in less than three weeks.
Rommel had never seen anything like it before—and probably never wants to see anything like it again. Expertly handled by the men of the British Eighth Army, it helped leave 500 of Rommel's tanks blazing wrecks on the sands at El Alamein.
Its building was an outstanding example of Democracy at work—for the job was shared. The many intricate parts of the M-7 were turned out in record time by thousands of men and women in garages and machine shops and small manufacturing plants scattered over the country. Without their loyal and unstinting help, the M-7 couldn't have been assembled in such record time or numbers.
This advertisement is a tribute to all who played a part in the building of this mighty weapon of war.
TO THE FOLLOWING GOES FULL CREDIT FOR THE AMAZING JOB THE M-7 HAS DONE:
1. To the many capable officers of the Ordnance Department of the U.S. Army for their cooperative leadership and guidance.
2. To its designers and engineers for their Yankee courage and ingenuity in building the M-7 in record time.
3. To the thousands of men and women of the American Locomotive Company who pitched in to turn the M-7 out in sufficient numbers to turn Rommel.
4. To the American railroads for the splendid job they did of getting every M-7 to its point of embarkation.
5. To the United States Navy for transporting these tank killers across thousands of miles of water and delivering them safely.
6. To the heroic men of the British Eighth Army whose expert use of the M-7 finally blasted Rommel's hopes of getting through to Suez.
7. And to the hundreds of sub-contractors and suppliers, and others whose names are here listed, for their unflagging cooperation in the building of this mighty weapon of war.
American Locomotive Company
SUBCONTRACTORS, SUPPLIERS AND OTHERS WHO HELPED IN THE BUILDING OF THE M-7:
American Brass Co., New York
American Brake Shoe & Fdy. Co., American Manganese Steel Div. Chicago Heights, Ill.
American Can Co., New York
American Car & Fdy. Co., New York
American Chain & Cable Co., N. Y.
American Chain Div.
Hazard Wire Rope Div.
American Felt Co., Glenville, Conn.
Thank you

Our congratulations to American Locomotive for this inspiring message. Our thanks to you for including Hazard Wire Rope Division among those who helped build the "tank-killer." • In your list of 445 manufacturers we found 136 who use Hazard Wire Rope in their product, in their plants, or both. • Such interchange of industrial products, such mutual help in times of difficulty, will help win the war, will help win the peace, as it has done from our country's earliest years.

HAZARD WIRE ROPE DIVISION

Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Portland, Tacoma

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT, CONNECTICUT

HAZARD LAY•SET WIRE ROPE

The tree that was taken Prisoner

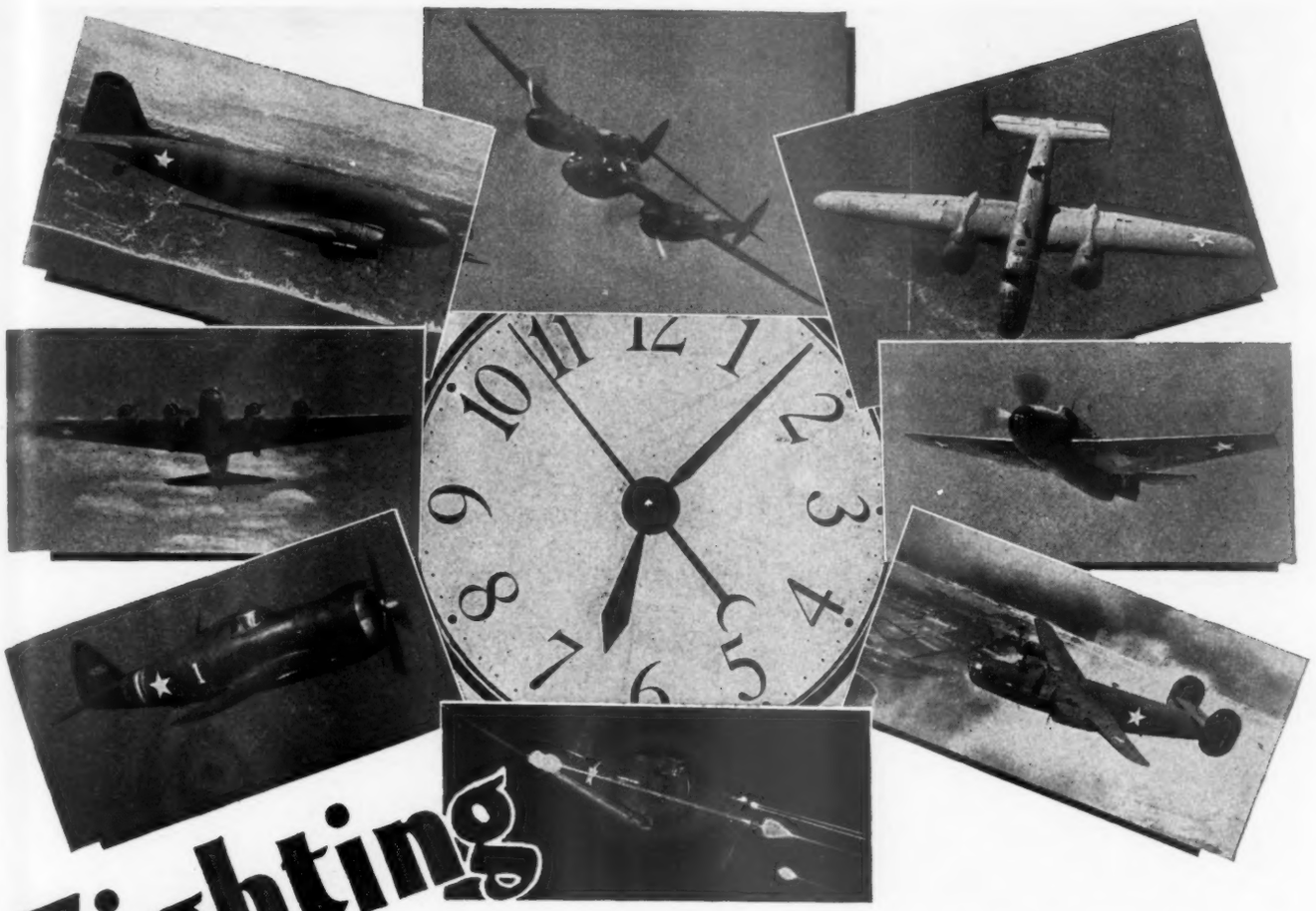
● Enslaved! — shackled! — the lordly rubber tree, source of one of the most essential of all our raw materials, is captive to Japan!

So what? . . . the breakdown of our whole war effort? — no! Inferior equipment for our fighting men? — no! The wrecking of our home front transportation system? — no! For fighting mad, American chemists and engineers went to work and almost overnight came up with a miracle — the miracle of synthetic rubber.

We, here at Acushnet, are proud to have had a part in adapting many synthetic rubber compounds to uses of war. We're happy that thirty-two years of processing natural rubber into merchandise for civilian use (including about the best ball any golfer ever belted down a fairway) gave us the "know-how" necessary to meet the tough requirements of the Armed Services with equipment molded of synthetic rubber for our men in blue and olive drab and khaki.

Today, Acushnet products fight on every front — on land, at sea, and in the air. And when peace comes you'll find synthetic rubber products molded by Acushnet ready to serve your comfort and convenience in home and office and factory.

ACUSHNET PROCESS CO., NEW BEDFORD, MASS. • PROCESSORS OF PRECISION-MOLDED RUBBER GOODS



Fighting AROUND THE CLOCK

Aeroquip standard Hose Lines with Detachable Fittings—and Aeroquip Self-Sealing Couplings—are in action around the clock, around the world.

They give our combat ships more time in the air—by requiring less time on the ground. "Aeroquip" means fast emergency field service with standard Hose Lines and Detachable Fittings. It means important weight-saving . . . and replacement parts simplified from **thousands** of combinations of old-style sizes and lengths of fixed lines to **dozens** of fittings and hose sizes. Researched for performance to —70° F.

With Aeroquip Self-Sealing Couplings, liquid carrying lines can be disconnected without draining or loss of fluid, and instantly re-connected without admission of air.

These advantages save time. Time saved can mean lives saved and battles won.

SPECIFY

AEROQUIP

HOSE LINES

WITH DETACHABLE RE-USABLE FITTINGS

SELF SEALING COUPLINGS

This war-tested equipment opens new fields for industrial and chemical uses.

West Coast Office—
L. W. Pickens,
1709 W. 8th St., Los Angeles

Eastern Representative—
J. Henry Reisner,
Hagerstown, Md.

Canadian Representative—
Prenco Progress & Engineering Corp.,
7274 Stafford St., Toronto, Canada

AEROQUIP CORPORATION
JACKSON, MICHIGAN, U. S. A.

GENERAL INDUSTRIES *Molded Plastics*

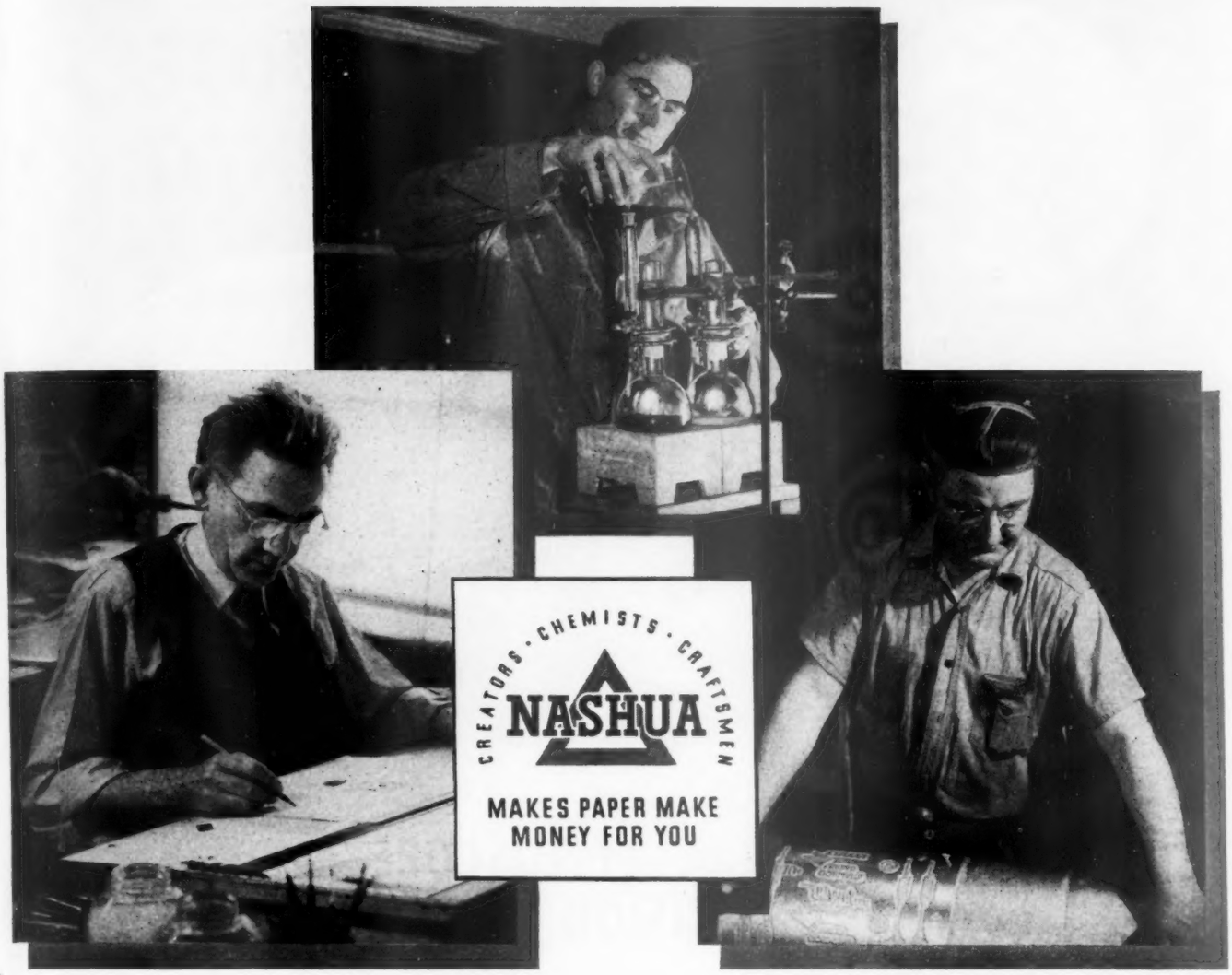
● General Industries is making a wide range of molded plastics parts that serve in a diversity of fields in the war and in activities that directly support the fighting fronts. In producing these, General Industries has built on and extended the experience and skill gained throughout the years producing for industrial needs.

By the same token, when the transfer is made back to producing for peacetime needs, General Industries will be better equipped than ever before to render dependable, satisfactory service to manufacturers of industrial equipment, autos, radios, electronic devices, and all manner of appliances that will make the world a better place to live in.

THE GENERAL INDUSTRIES CO.

Molded Plastics Division • Elyria, Ohio

CHICAGO: Phone Central 8431 NEW YORK: Phone Longacre 5-4107
DETROIT: Phone Madison 2146 MILWAUKEE: Phone Daly 4057
PHILADELPHIA: Phone Camden 2215



ACHIEVEMENT THROUGH ORGANIZATION

The three skills upon which our business is founded — *Creators, Chemists and Craftsmen* — represent nearly 100 years of progressive cooperation. As is the case today, several wars have to some degree affected the sustained progress of this organization. Against these comparatively brief interruptions, *Nashua* has continually combined science and skill and applied them to greater fields of usefulness.

Those skills are now serving under the conditions of war. But, *Nashua* is preparing them to play an even greater part in the peace which will follow.

We are converters of paper — coating, gumming, impregnating, laminating, printing, waxing. Our base material is paper of many types. We are also converters of Cellophane.

NASHUA GUMMED AND COATED PAPER COMPANY
NASHUA, N. H.

★ BUY MORE WAR BONDS ★

U.S. NAVY PHOTO

IS EASY—

THANKS TO AMERICAN CYSTOSCOPE PRECISION EQUIPMENT MAKING

Like their famous line of precision optical surgical instruments, American Cystoscope Makers, Inc. are now producing equipment of untold value, sending it to the very corners of the world. They are one of the big reasons for beating the Axis and the Axis is now taking lessons from our optical instrument development which has far exceeded anything made abroad.

If your aim is better shipping, investigate Mason MailMaster, the convenient, quick, and safe mailing box whose engineered construction and easy closure make for safe delivery.

THE MASON BOX CO.
ATTLEBORO FALLS, MASS.
175 5TH AVE.
NEW YORK

It's a cinch, our adman said, to write this is a "pipe,"
I needn't make a layout or set a lot of type.

The only thing I have to do is build a factual rhyme,
That tells how hard we're working to get you steel on time!

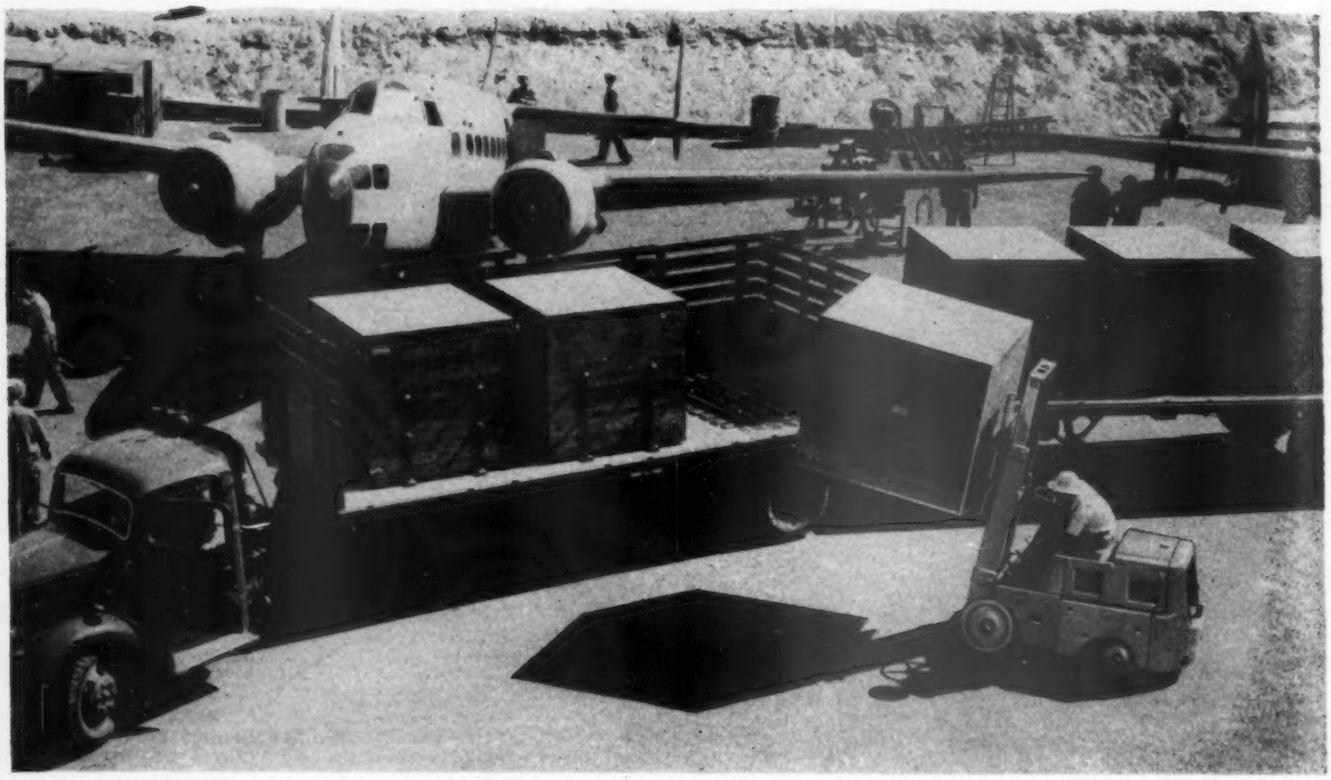
When you need an angle quick, or a beam or bar,
We can get it to you, no matter where you are.

At any time of day . . . or even if it's night,
You can rely on Levinson to do the job just right.

LEVINSON STEEL SALES CO.
33 PRIDE STREET · PITTSBURGH, PENNA.
Warehouse and Specialty Steels

4

TOMORROW'S MATERIAL HANDLING PROBLEMS



★ ★ ★ BUY WAR BONDS ★ ★ ★

SOLVED TODAY BY CLARK TRUCTRACTOR

There's no time to waste when planes have delivered rush shipments, or fast transport trucks are waiting for loads.

Materials must be moved — time and manpower must be saved, Clark Fork Trucks speed deliveries and the day of an early Victory — definitely.

ARMY E NAVY

CLARK TRUCTRACTOR
DIVISION OF CLARK EQUIPMENT COMPANY
BATTLE CREEK, MICHIGAN, U.S.A.

Belting and Hose with a Thumb

The thumb gives man his mastery over animals—his control of physical activity. The thumb symbolizes power and capability; strength put to work.

We say "Belting and hose with a thumb" because this statement best expresses the extra something that distinguishes Thermoid belting, hose and other industrial products. The engineers who design these products, and the production specialists who build them, have a realistic viewpoint that takes end-use problems into consideration. Beyond the belting and the hose, they see the tasks to be performed in the transmission of power and the movement of material.

This approach results in products that establish outstanding performance records . . . products that are born with the extra serviceability symbolized by the thumb. When "Thermoid" is on the products, everyone from the President down knows that the Purchasing Agent is buying the very best that can be had.

P.S. In line with material conservation, Thermoid has prepared a series of bulletins on how to extend the life of rubber products now in use. You might find them helpful to be passed on as reminders to your operating people. Feel free to ask for copies.

THE THERMOID LINE INCLUDES: Transmission Belting • F.H.P. and Multiple V-Belts and Drives • Conveyor Belting • Elevator Belting • Wrapped and Molded Hose • Sheet Packings • Industrial Brake Linings and Friction Products.

Thermoid Rubber
DIVISION OF THERMOID CO.
TRENTON, NEW JERSEY

IT'S GOOD BUSINESS TO DO BUSINESS WITH THERMOID

Official photo U. S. Army Signal Corps

DOUBLE TROUBLE... *Gritty Mud and Racking Grind!*

Rurrhr... uhrurrhr... has a familiar ring, hasn't it? And, it wasn't a pleasant sound, was it? Sitting there with your foot on the gas and your hand on the gear-shift, you listened to wear and strain tearing the life out of your car. It was something you always thought about *afterwards.* You probably gave *the car* all the credit for taking the beating . . . never thinking of the bearings that absorbed most of the punishment.

You can bet your bottom dollar, our boys in the Army know how important bearings are . . . for the fellows that push trucks and tanks around know exactly where wear and strain attack. Most of the time, they can't take the *time* to be careful. If a bearing fails, it might mean that a link in an importan. supply chain is broken. That's why bearings have to be better than good, more reliable than just dependable. To help produce enough of that kind of bearings for the Army, the Navy, and industry here at home is our job. The Fafnir Bearing Company, New Britain, Conn.

FAFNIR

BALL BEARINGS

POWERED WITH PHILCO "XL" BATTERIES,
YOUR MOTORIZED HAND LIFT TRUCKS
HAUL 10% MORE MATERIAL!
In a constantly increasing number of plants from coast to coast, *battery-powered hand lift trucks* are doing a tremendously successful job in the field of materials handling!
For every make and every model, Philco offers a rugged, dependable battery specially engineered for heavy-duty motive power service!
Powered with Philco "XL" Batteries, motorized hand trucks haul 10% more material! Plate for plate, you get 10% greater capacity in a Philco . . . with extra wallop and sustained high voltage, hour after hour!
Get the facts on Philco Batteries for motorized hand lift trucks. In every important industrial center from coast to coast there's a Philco representative ready to serve you.
PHILCO CORPORATION
STORAGE BATTERY DIVISION
TRENTON 7, NEW JERSEY
SPECIFY RUGGED
PHILCO
BATTERIES

26 Divisions Help Speed Victory

HELPING the automotive industry supply America's Armed Forces on land, sea and in the air with the mechanized units needed for victory is Auto-Lite's one purpose. It's the all-out job of every one of the men and women employed in Auto-Lite's 26 great manufacturing divisions. Some of the items produced by the world's largest independent manufacturer of automotive electrical equipment for fronts all over the world include:

STARTING, LIGHTING AND IGNITION • SPARK PLUGS • BATTERIES • RELAYS • SWITCHES AND GOVERNORS
FIRING CONTROL APPARATUS • FUSES • ETCHED, EMBOSSED AND LITHOGRAPHED NAMEPLATES
GENERATORS • HORNS AND SIGNAL DEVICES • METAL STAMPINGS • INSTRUMENTS AND GAUGES
PROJECTILES • REGULATORS • STEEL CARTRIDGE CASES • ALUMINUM AND ZINC DIE CASTINGS
WIRE AND CABLE • MESS KITS • GUN FIRING SOLENOIDS • BLACKOUT LIGHTING • IRON CASTINGS
BOOSTERS • PLASTIC PRODUCTS • LEATHER GOODS • FRACTIONAL HORSEPOWER MOTORS
GUN FEED MECHANISMS • ARMOR PLATE • TRACER AND IGNITER SHELLS • GUN SIGHT CASES
AUTOMATIC PILOTS • DIRECTIONAL GYROS • AUTO-GYRO COMPASSES

TOLEDO, OHIO THE ELECTRIC AUTO-LITE COMPANY SARNIA, ONTARIO

AUTO-LITE

PLANTS IN: ST. LOUIS, MO. • PITTSBURGH, PA. • MEADVILLE, PA. • JERSEY CITY, N. J. • PORTSMOUTH, VA. • ST. PAUL, MINN. • CHICAGO, ILL

AT BRISTOL BRASS

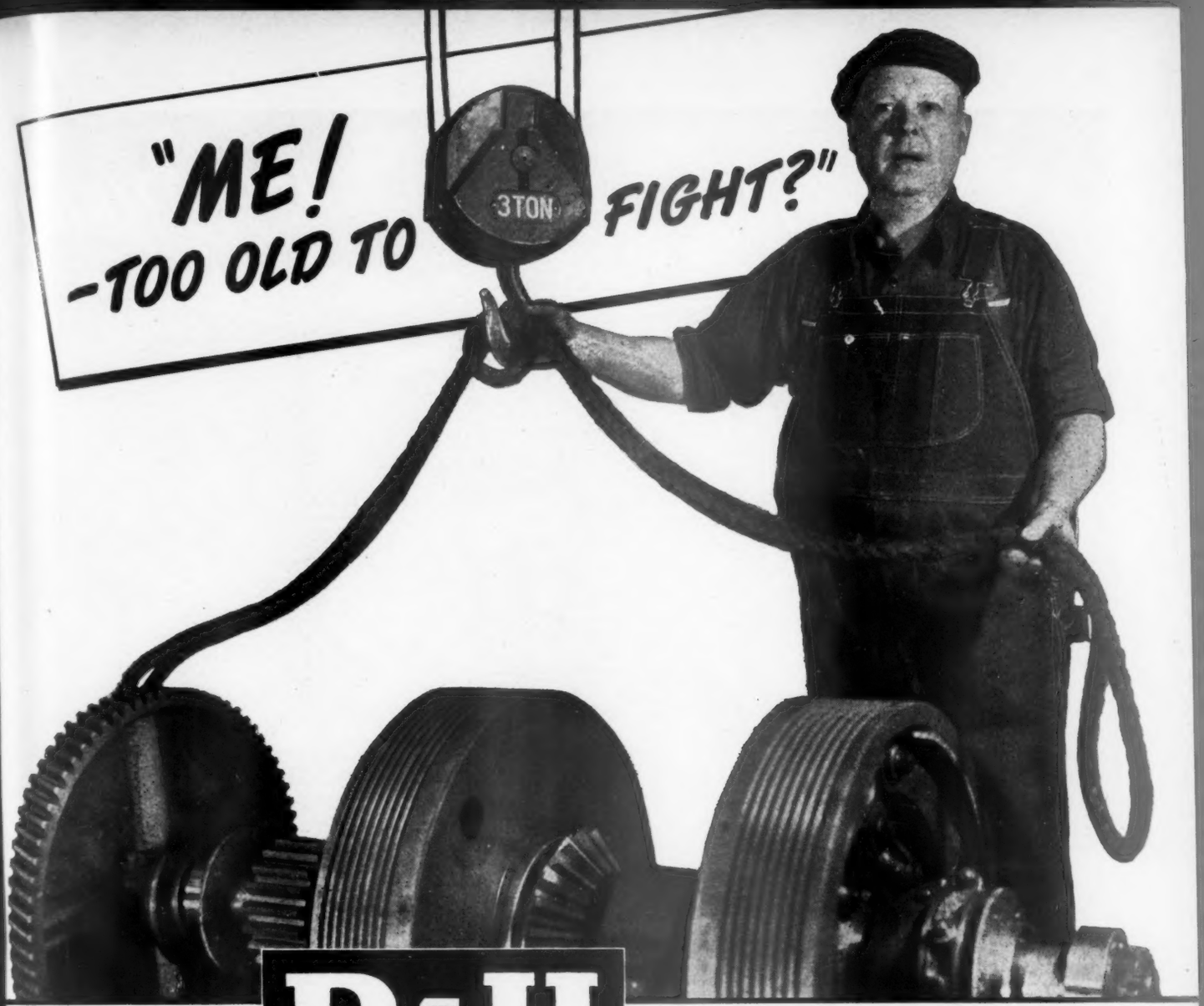
a lot of business is done in this same neighborly way

AS FAR as we have been able to see, in 92 years of brass-making, there's no reason why a business relationship can't be as pleasant, enjoyable . . . and mutually profitable . . . as the easy give-and-take between two neighbors discussing their Victory gardens across the back fence. For that's the way business gets done most quickly and satisfactorily, when conventionalities are detoured and brass tacks are reached without delay.

So the first time you do business with Bristol, you'll find this organization is "easy as an old shoe" to get along with. You won't be kept waiting by the man who can best answer your questions—be he chairman, president, or general manager. You'll find him with his coat off, and he'll invite you to shed yours, too. And, if you like your answer straight, he's your man.

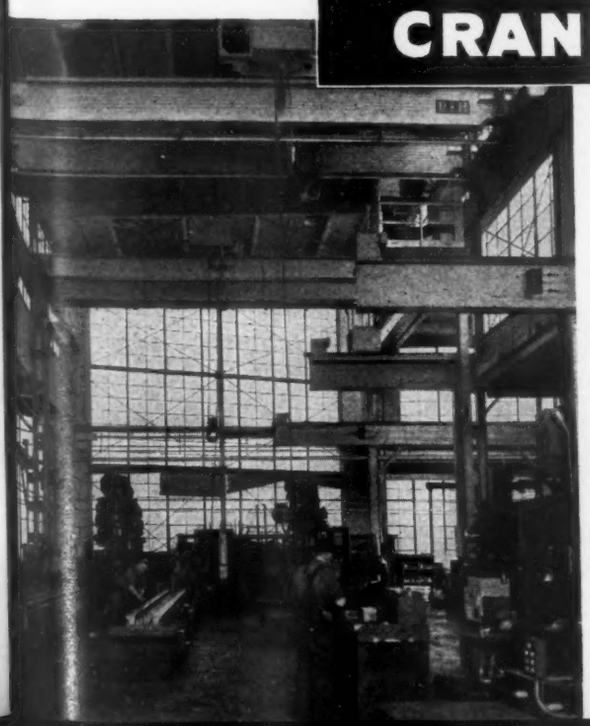
In this friendly, informal atmosphere, things get done faster and better . . . which is the reason we have been on the best of terms, for scores of years, with many of the largest users of brass sheet, rod, and wire. If this also happens to be *your* way of doing business—then we'll be glad to meet you, neighbor, and see what we can do to help you on your post-war plans.

THE BRISTOL BRASS CORPORATION, *Makers of Brass since 1850, Bristol, Conn.*



P&H TRAV-LIFT CRANES

A new star has been added to P&H's award for excellence in war production.



"Maybe the Marines won't take me! So what? There's a fighting job for me right here on the production line. And with these modern helps, I'll keep pace with the best of them!"

Now you're talking, Old Timer! And you can do it, too! For those old back-breaking, man-killing jobs are out wherever the P&H Trav-Lift comes in. Take any load up to 15 tons: You can pick it up *anywhere* in the area served by a Trav-Lift; you can move it, lower it precisely where you want it *without* rehandling. It's all done swiftly, smoothly; no effort to it.

Modern P&H Trav-Lifts are saving time and energy and speeding up production in war plants everywhere. They make more efficient fighters of production men in wartime. They cut handling costs any time.

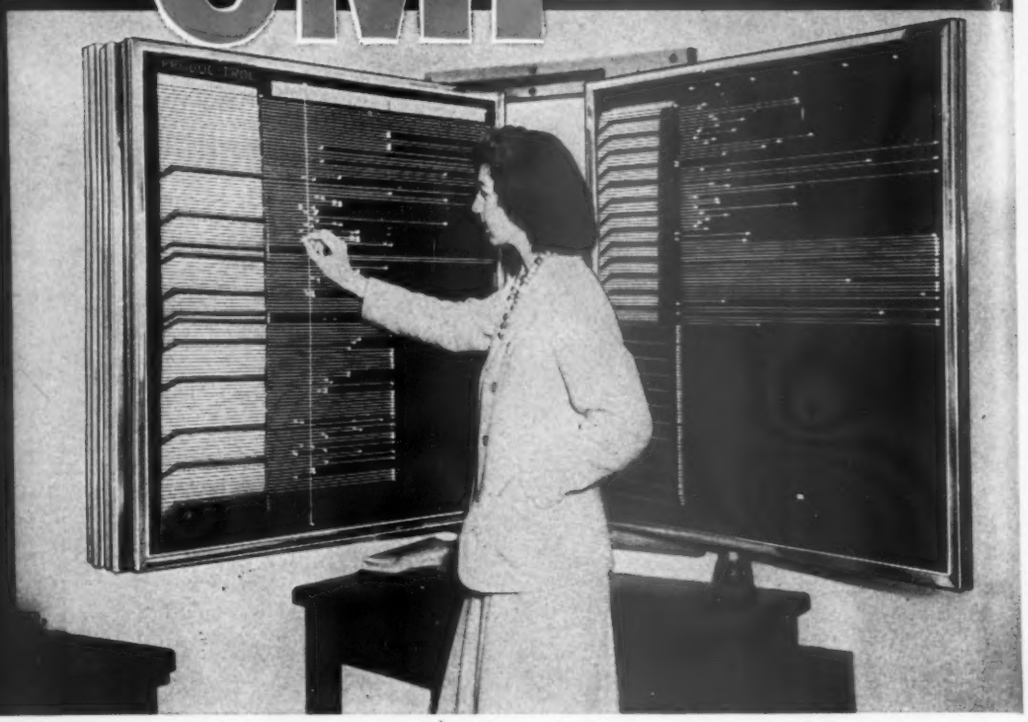
Operated from the floor by magnetic push-button control. Five-speed variable speed control is also available. Built in capacities up to 15 tons for moderate duty or "helper" crane service. Write for literature.

General Offices: 4577 West National Ave., Milwaukee, Wis.

HARNISCHFEGER CORPORATION

ELECTRIC CRANES • EXCAVATORS • ARC WELDERS P&H HOISTS • WELDING ELECTRODES • MOTORS

CONTROL YOUR CMP OPERATIONS WITH ONE EMPLOYEE



BATTERY OF PRODUC-TROL BOARDS AT YARD, INC., PASADENA, CAL.

PRODUC-TROL THE PRODUCTION CONTROL BOARD WITH VISIBLE INDEX ATTACHED . . .

SHOWS YOU INSTANTLY

- What minimum and maximum balance of material to maintain and what to do about it.
- How to continually regulate your inventory.
- What allowances are made for quarterly regulations.
- How to easily maintain your balance during the quarter on:

ALLOCATION—60 DAY MAXIMUM—VENDOR ORDERS

- Saves Man Power.
- Expedites material.
- Puts all the facts in front of your eyes every minute of the day.
- PRODUC-TROL is simple, can be handled by any clerk.

PRODUC-TROL tells you INSTANTLY what operation is behind schedule in...

- Production Scheduling • Contracting
- Machine Loading • Material Control
- Sub-Contract Control • Purchasing
- Individual Order Scheduling • Expediting
- Control of Parts into Assemblies
- Parts Production in Lots by Operation

Send for complete details on PRODUC-TROL applied to CMP—Controlled Materials Plan—and how it can be handled by one clerk.

MAIL THIS COUPON TODAY

- PRODUC-TROL speeds production in over 1100 War Plants.
- What PRODUC-TROL is doing for others it can do for you.
- A line on your letterhead brings "SPOTLIGHT", illustrating the complete PRODUC-TROL line.

If "information" cannot give you the telephone number of PRODUC-TROL in your city, phone, wire or write—

WASSELL ORGANIZATION

WESTPORT, CONN.

PHONE: WESTPORT 2-4743

In Canada: Seeley Systems Corp., Ltd., Toronto and Montreal

Please send details on PRODUC-TROL applied to CMP.

Name.....

Address.....

City.....

State.....

PURCHASING PREVIEWS

From the Washington office of

PURCHASING

National Press Building
Washington, D. C.

August 2, 1943

For Purchasing Executives:

CMP IS OPERATING SMOOTHLY, primarilybecause it has served to bring supply and demand for materials more accurately into balance. In addition, the entire war production picture has altered, and the tendency toward maintaining maximum or excessive inventory is a distinct disadvantage under conditions where changes in contract are possible.

In some ways, the picture has been further stabilized. The basic production lines have been established. There is no longer a mad scramble for facilities, tools and materials.

On the other hand, there is no longer a guarantee of a long period of uninterrupted production of a particular item. Now that actual large scale battle has been encountered, the production lines are being tailored to the needs of the fighting fronts. This makes for shifts in production, and means that manufacturers must be quick to adapt their operations to changes in design. Close contact with the procurement officers of the armed services is an indicated necessity.

* * *

SCHEDULING OF CRITICAL COMPONENTS is now in operation. WPB has approached the problem with caution, on the premise that a detailed job of components scheduling should be launched only as a necessary evil.

The problem of material shortages tended to ease only when supplies were brought into balance with demands, and final solution to the components problem will be settled in similar manner.

Actually, the number of components which are critically short will be narrowed down considerably. The Components Scheduling Order M-293 names a number of broad classifications, which, however, will be further defined as to type and size so that the scheduling procedure is applied only to components which are short. The procedure will be applied to additional components only when prime contractors consuming the components indicate that they cannot obtain delivery in time to meet their production schedules. When such reports are received, attempt will be made, through conference and analysis, to solve the component shortage through methods short of detailed scheduling.

If these efforts fail, the procedures outlined in the Component Scheduling Procedure will be applied.

While production facilities for some types and sizes of components may be short, it is indicated by WPB officials that the major causes for shortages are:

1. Maldistribution of orders.
2. Consumers' inflation of component requirements, through calling for delivery sooner than needed.
3. Inflation of priorities, placing less important end uses ahead of more urgent ones.

Obviously, these can be corrected without the detailed scheduling controls, or through a partial exercise of such controls, and WPB will seek to accomplish this.

The scheduling plan is closely integrated with the operation of CMP, and is in fact patterned after it, applying to components and subcomponents the same control technique as CMP applies to the controlled materials.

WPB statement explaining the scheduling plan, and chart illustrating paper flow can be obtained from the Bureau of Public Inquiry, War Production Board, Social Security Building, Washington, D. C., by referring to Press Release WPB 3734. Copies of Form PD-903 and Instructions for use of PD-903 (reporting form used in conjunction with the scheduling plan) can be obtained from the above source by request.

CLOSER SCRUTINY OF WAR CONTRACTS by the service contracting officers will result from the criticisms of extravagance voiced in Congress during the closing sessions. War production has gone through several phases, the _rst being an unquestioned demand for military equipment of all kinds, at practically the asking price.

In view of the urgent demand, and the immediate dangers, neither the public nor Congress voiced any concern over waste. There was a general understanding that wasted funds were a small price to pay for security, and that the need to accomplish in months what the enemy had been building over a period of years was a prime consideration.

The second phase resulted from the diversion of practically all metals away from civilian goods into war production, forcing the conversion of plants, large and small, into producing for the war. This necessitated an adjustment in contracting policy, with greater stress on subcontracting. At the same time, it was apparent that the smaller producers required a greater price latitude--at least during the conversion states.

Currently, there is the realization that production has reached a stage where there is no longer question as to our ability to meet the requirements of our armed services. This assurance is so definite that Congress is beginning to apply a new yardstick to production costs--that of value received on a comparative basis, taking into account the production costs of low-cost producers.

This new trend will reflect in renegotiation of contracts, and in placement of new contracts.

* * *

DISPOSAL OF SURPLUS INDUSTRIAL PROPERTY no longer required by the Army has been simplified to permit return of such property into war uses, or scrapping for recovery of metal.

The new procedure authorizes Army disposal of industrial property for direct war use at any time by sale or lease to war contractors; by transfer to other War Department components or to the Navy; and by transfer to the American Red Cross and the United Service Organizations.

For the purposes of expediting and to insure disposal to the best possible advantage, all surplus property under the new procedure will be listed in five categories:

Part 1: Critical equipment items such as steel valves, pressure vessels, heat exchangers, pumps, compressors, machine tools, etc.

Part 2: Construction equipment.

Part 3: Equipment and other industrial property not included in the other categories, which should be redistributed on a national basis.

Part 4: Controlled materials including copper, steel, copper base alloy and aluminum.

Part 5: Property which can be practically redistributed on a regional, rather than a national basis.

Circularization lists of all these properties will be published and for a period of 20 days,property can be disposed of only for direct war use by government agencies or war contractors.

Upon the expiration of the 20-day period, remaining items of construction equipment will be reported to Procurement Division of the Treasury Department. Such items as are not disposed of by Procurement Division within a reasonable time may be sold by the War Department to any purchaser.

The Corps of Engineers will screen all listed construction equipment during the 20-day circularization period in order to assure that all equipment suitable for tactical use is retained by the War Department.

Other items remaining at the end of the 20-day period will be reported to War Production Board. Items so reported will be available to War Department components, other government agencies, and may be sold to any private purchaser.

Thus, after a brief circularization period of 20 days, property which cannot practicably be returned directly for use in the war effort may be sold to dealers and jobbers, or returned to manufacturers, for indirect, but expeditious, return to industrial use.

Items of property for which a use cannot be found under these procedures within a reasonable time--say three or four months--after their availability is broadly publicized will be scrapped and returned to use as basic metal.

APPOINTMENT IN TULAGI

IT'S "BOUND TO GET THERE" WITH *Acme Steelstrap*

THIS shipment had a date with U.S. Armed Forces in the far Pacific. It kept that appointment . . . because it was packed right and strapped right. Proper packing kept it free from damage all the way to destination.

In co-operation with Government services, carriers, and manufacturers, Acme engineers are helping to assure adequate protection for overland and overseas shipments of practically every type of war product . . . packed in boxes, cartons, crates, bales, bundles or on skids. For carload ladings . . . Acme Unit Load Bands are used to make carload shipments "Bound to Get There."

Acme Steelstrap complies with all Federal Strapping Specifications. Applied with Acme strapping tools, Acme Steelstrap provides a faster, more economical way of moving vital shipments to the fighting fronts in all parts of the world.

If you are engaged in war production, Acme engineers will be glad to help you plan for the safe arrival of your products. Contact the Acme Steel office nearest you.

ACME *Steelstrap* PROCESS

ACME STEEL COMPANY, General Offices: 2842 Archer Avenue, CHICAGO, ILLINOIS

Atlanta Baltimore Boston Detroit Indianapolis Los Angeles Milwaukee New Orleans New York
Philadelphia Pittsburgh Portland St. Louis St. Paul San Francisco Seattle

ACME STEEL COMPANY of CANADA, LTD., Montreal, Toronto, Winnipeg, Vancouver

Do your Workers Wear their Safety Goggles?

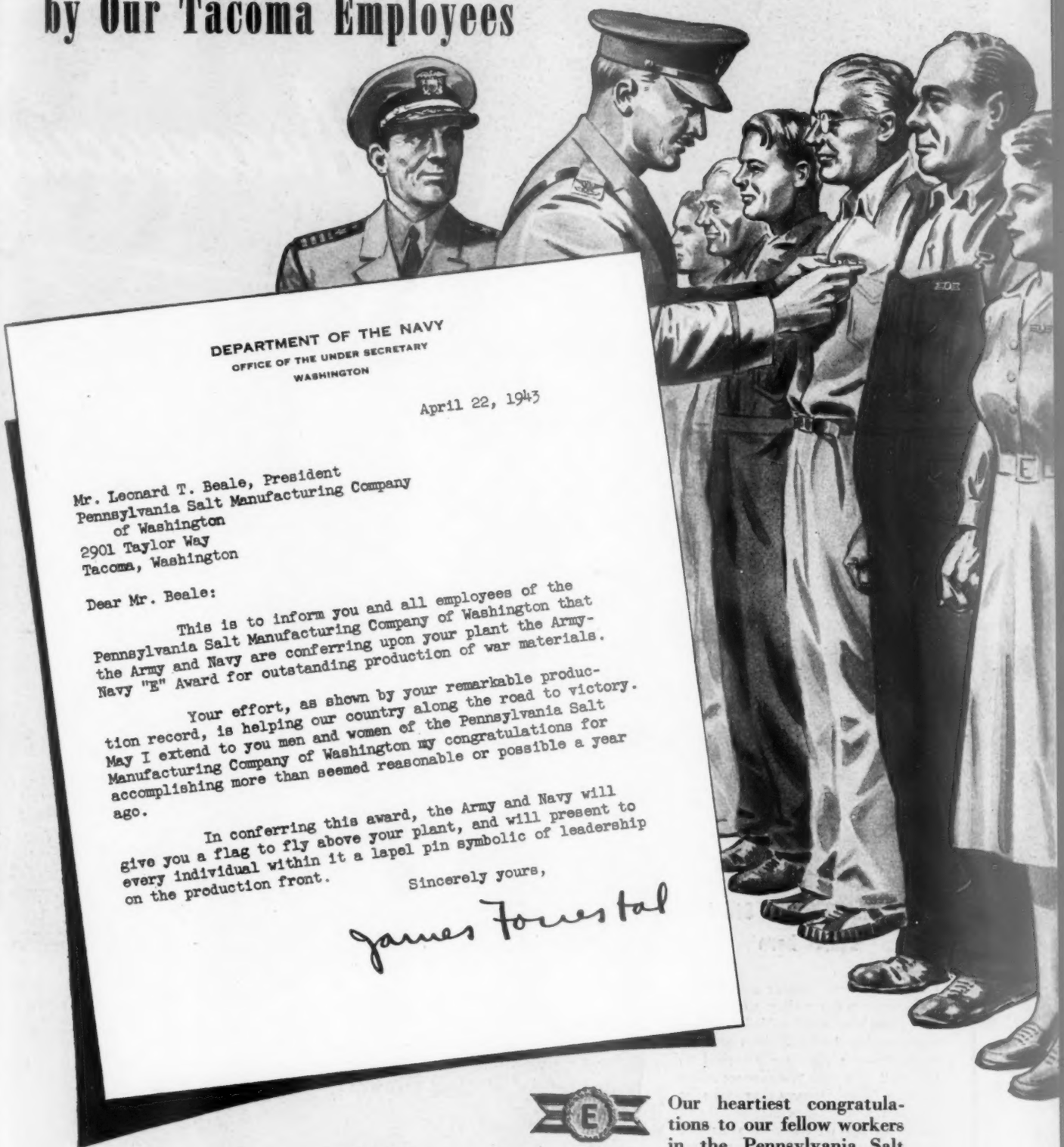
Bausch & Lomb Safety Goggles with impact resisting plano or prescription ground lenses, will give eyesight protection and correction only if your workers *wear* them on the job.

Here is another Bausch & Lomb bulletin board poster (one of a series) to help you strengthen and re-inforce your eyesight conservation campaign, to augment the story you are telling in your employee publication, on pay envelopes and in other ways. It is a graphic reminder to your employees that wearing safety goggles on the job will eliminate unnecessary suffering . . . that their eyesight is essential to the war effort.

Bausch & Lomb will be glad to supply a sufficient quantity to answer your bulletin board requirements. Poster size is 13¾" x 21¾". Write to Bausch & Lomb Optical Co., 741 St. Paul St., Rochester, N. Y.

BAUSCH & LOMB
Safety Goggles

For Distinguished Service by Our Tacoma Employees



DEPARTMENT OF THE NAVY
OFFICE OF THE UNDER SECRETARY
WASHINGTON

April 22, 1943

Mr. Leonard T. Beale, President
Pennsylvania Salt Manufacturing Company
of Washington
2901 Taylor Way
Tacoma, Washington

Dear Mr. Beale:

This is to inform you and all employees of the Pennsylvania Salt Manufacturing Company of Washington that the Army and Navy are conferring upon your plant the Army-Navy "E" Award for outstanding production of war materials.

Your effort, as shown by your remarkable production record, is helping our country along the road to victory. May I extend to you men and women of the Pennsylvania Salt Manufacturing Company of Washington my congratulations for accomplishing more than seemed reasonable or possible a year ago.

In conferring this award, the Army and Navy will give you a flag to fly above your plant, and will present to every individual within it a lapel pin symbolic of leadership on the production front.

Sincerely yours,

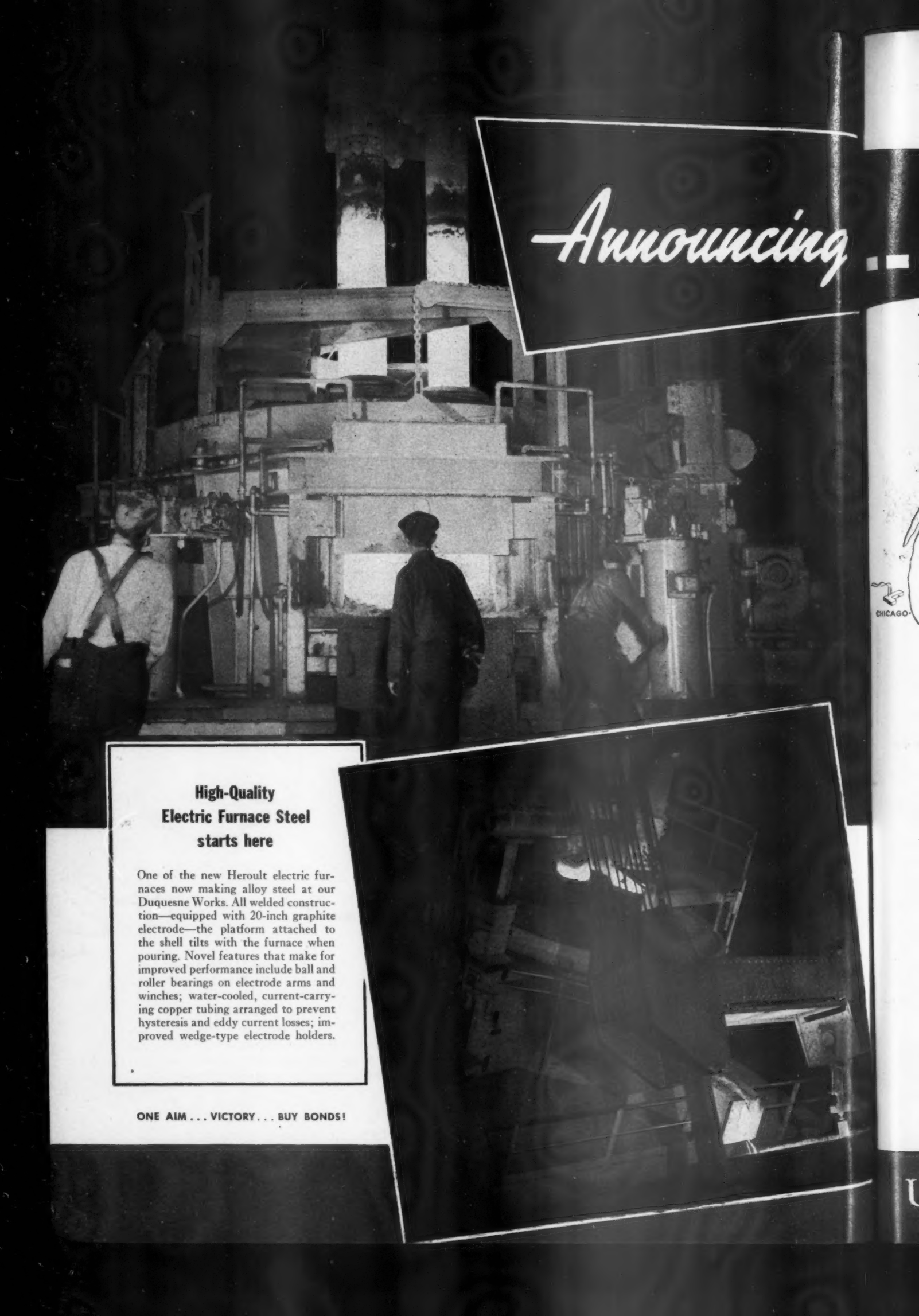
James Forrestal

Our heartiest congratulations to our fellow workers in the Pennsylvania Salt Manufacturing Company plant at Tacoma, Washington, for having won the prized Army-Navy "E". We know the honor is well-deserved — and this achievement is further inspiration to the entire Penn Salt organization in all its wartime activities. Let us all continue to do our utmost to bring closer the day of Victory.

PENNSYLVANIA SALT
MANUFACTURING COMPANY
1000 WIDENER BUILDING, PHILADELPHIA 7, PA.

PENN SALT *Chemicals*

PLANTS: PHILADELPHIA • EASTON • NATRONA
WYANDOTTE • TACOMA • PORTLAND, ORE.



High-Quality Electric Furnace Steel starts here

One of the new Heroult electric furnaces now making alloy steel at our Duquesne Works. All welded construction—equipped with 20-inch graphite electrode—the platform attached to the shell tilts with the furnace when pouring. Novel features that make for improved performance include ball and roller bearings on electrode arms and winches; water-cooled, current-carrying copper tubing arranged to prevent hysteresis and eddy current losses; improved wedge-type electrode holders.

ONE AIM . . . VICTORY . . . BUY BONDS!

New, greatly increased Electric Furnace capacity to serve the East with quality alloy steels

IMPORTANT to every user of alloy steel in the Eastern area is the recent expansion of our electric furnace capacity at Duquesne, near Pittsburgh.

Now in operation, this large and thoroughly modern plant brings to your very door-step, facilities for rolling, annealing and heat-treating a complete range of fine electric furnace steels in all commercial forms.

Equipment throughout, from raw materials handling to finish processing, embodies the most advanced ideas in electric steel production.

High-efficiency Heroult electric furnaces of the very latest type assure top metallurgical performance. With capacities ranging from 7 to 70 tons each, they provide a wide degree of flexibility to handle both large and small orders.

Soaking pits are provided with automatic combustion control to insure greater uniformity in heating the steel. A seven-chamber continuous annealing and heat-treating furnace, automatically controlled, insures superior physical properties in the heat-treated product. It is supplemented by batch type furnaces for handling larger bar sizes and special heat-treating requirements.

The auxiliary equipment is of the latest, most improved design and is adequate to meet the many and various needs of the alloy steel user.

Equipment facilities are matched in calibre by the skill of experienced mill and metallurgical personnel whose constant watchword is "Quality First."

Now ready to expedite the servicing of your wartime needs for electric steels, this new plant will, in the future, be ready to serve your peacetime requirements—both in small and large tonnages—with the same high quality for which U·S·S Carilloy Steels are noted.

CARNEGIE-ILLINOIS STEEL CORPORATION

Pittsburgh and Chicago

Columbia Steel Company, San Francisco, *Pacific Coast Distributors* · United States Steel Export Company, New York

USS

UNITED STATES STEEL

★MOBILIZING★ MATERIALS

No. 9 of a series of actual examples of GRAYBAR service, providing electrical materials to be installed in ships, planes and other war products.

When a launching date hung by BASKET WEAVE CABLE...

A shipyard was "stumped" for a quantity of basket-weave electrical cable urgently needed to complete a group of tankers. Unless the cable could be delivered on the job within 24 hours, construction schedules would bog down, launching dates would not be met.

Feverish activity in the yard's purchasing department failed to turn up a single foot of cable. One of their calls went out to GRAYBAR. But even GRAYBAR'S knowledge of cable manufacturers served only to verify that none of the missing "basket-weave" was to be found in stock.

Then Graybar ingenuity swung into action. A call to the GRAYBAR office in a neighboring city revealed that a shipyard there had received a shipment of cable of the type required. Upon explanation of the urgent need, arrangements were made for this customer to "borrow" enough to meet the emergency. Before the one-day deadline was up, the cable reached the job, and construction proceeded according to plan.

This is but a sample of GRAYBAR flexibility in furnishing electrical materials to be installed in ships, planes and ordnance . . . production items as well as construction items. In your day-to-day purchases of electrical supplies, you'll find GRAYBAR equally successful at expediting delivery, at fitting in with your purchasing procedure, at saving buying time all down the line. Why not check with GRAYBAR today?

Executive Offices: GRAYBAR BUILDING New York, N. Y.

GraybaR

IN OVER 80 PRINCIPAL CITIES

Everything Electrical . . . THAT IT TAKES TO WIN!

PURCHASING

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Orange, Conn.

THE U.S.S. OKLAHOMA IS RIGHT SIDE UP

AMERICAN CABLE TRU-LAY PREFORMED WIRE ROPE DID THE PULLING

Official U. S. Navy photograph

Pearl Harbor, Hawaii. Even Date—The 29,000 ton U.S.S. "Oklahoma" is again afloat. During months of preparation by the Pacific Bridge Company, some 50 miles of TRU-LAY Preformed and CRESCENT Non-Preformed wire rope (ranging in diameter from 1″ to 3″) was shackled to the huge ship, then in less than 69 hours operating time the "battlewagon" was pulled out of her list of 151 degrees back to within 10½ degrees of natural position.

For this spectacular job, a sling or bridle was put over the ship. This bridle was made of 42 lengths (averaging 360′) of 3″ CRESCENT Non-Preformed rope. Attached to this were 21 reels (10,000′ each) of 1″ TRU-LAY Preformed wire rope. These were attached to winches ashore, and after less than three days steady pulling, the "Oklahoma" was right side up.

The American Cable Division, not only for this shining example but for its less spectacular day-in and day-out effort, is proud to be numbered among those who are working to speed the war's victorious end.

AMERICAN CABLE DIVISION Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Detroit, Houston, Los Angeles, New York, Philadelphia, Pittsburgh, San Francisco, Portland, Tacoma

AMERICAN CHAIN & CABLE COMPANY, INC.

BRIDGEPORT, CONNECTICUT

ESSENTIAL PRODUCTS . . . TRU-LAY Aircraft, Automotive, and Industrial Controls, TRU-LOC Aircraft Terminals, AMERICAN CABLE Wire Rope, TRU-STOP Brakes, AMERICAN Chain, WEED Tire Chains, ACCO Malleable Castings, CAMPBELL Cutting Machines, FORD Hoists, Trolleys, HAZARD Wire Rope, Yacht Rigging, MANLEY Auto Service Equipment, OWEN Springs, PAGE Fence, Shaped Wire, Welding Wire, READING-PRATT & CADY Valves, READING Electric Steel Castings, WRIGHT Hoists, Cranes, Presses . . . *In Business for Your Safety*

MR. MAXON AND GRADE LABELLING

FEW public officials have resigned from office with so frank a critique of the agency in which they have been serving as did Lou R. Maxon, late Deputy Administrator of OPA. According to the political code, his blast may not have been quite "cricket", but it was a healthy democratic gesture, and it is high time that OPA should be operated and judged by economic and administrative rather than political standards.

With most of Mr. Maxon's criticism we are in accord—"internal weakness, confusion, indecision, compromise, miles of legalistic red tape, and the presence of theorists in policy-making positions." We are also in accord with his ringing declaration that "OPA must not fail!"

But we can not concur with his specific charge that "Grade labelling . . . . presents the greatest threat to American industry and our way of life that ever existed, because it is without question the spearhead in a drive to eliminate brands, trade marks, and eventually free enterprise."

Fundamentally this controversy resolves itself into a question of whether industry is willing to buy and sell on the same basis—the basis of known quality. Industrial purchasing is founded on accurate specifications as the guarantee of quality and value. The validity of contracts and the acceptance of goods is predicated upon the observance of these specifications as minimum standards, which is but another form of grade labelling. The same guarantee can not logically be denied when industry appears in the role of seller.

From the administrative standpoint, it is difficult to see how any form of price control can be effective without quality standards as a measure of value.

Trade marks and brands alone do not constitute standards, but they can be much more. Based on known grading, they can be the guarantee of quality *plus* the embodiment of all those intangibles of manufacturing integrity, experience, and skills, and of merited consumer acceptance. But to deny that first step is to raise the suspicion that trade marks are used to conceal rather than to reveal and identify actual qualities and values. No competent industrial buyer accepts a brand or trade name without knowing just what it stands for. Once that is established, it becomes a valuable indicator for buying as well as for selling.

There is the danger, of course, that grade labelling administered by theorists may become too rigid and restrictive. The same danger exists in the use of specifications, but it doesn't destroy the soundness of the principle or the value of the method when properly applied. Industry needs to remember that every sale is a purchase, and every purchase a sale, depending on which side of the counter you happen to be standing.

Stuart F. Heinritz

CONCERNING WARTIME
VACATIONS

The terrific pace of war production continues—and with metals still on the critical list—men who buy are under greatest pressure. But brief periods of mental relaxation are still essential to health and efficiency. So, in the interest of your country, your company, your family and yourself—you should take some time off this summer.

True, travel is restricted. The boys in the Service have priority on transportation and God bless them. But a happy vacation really doesn't depend on distance—so plan ahead—leave your worries behind and soak up some good old sunshine.

And—as far as steel is concerned—tell your men to depend on Ryerson. Our stocks are still the most complete. And where war requirements have created some shortages, we can usually offer substitutes that will do the job as well.

So go ahead—enjoy yourself.

JOSEPH T. RYERSON & SON, INC.
CHICAGO • MILWAUKEE • ST. LOUIS • CINCINNATI • DETROIT
CLEVELAND • BUFFALO • BOSTON • PHILADELPHIA • JERSEY CITY

RYERSON

How and Why "SEARS" Buys from Thousands of Small Plants

1. Buy merchandise for resale to consumers and supplies for maintenance and operation from small decentralized manufacturing plants situated as close as possible to the respective places of end use of the goods or supplies. Thus reduce costs of distribution and prices to users.

2. Adapt policies and methods, products and supplies, by means of eliminations and "alternates" to meet the situations on materials caused by the needs of the nation for winning the war.

3. Look ahead for new materials and new products for production, packaging, sale, and use in the era to come after war is won.

By

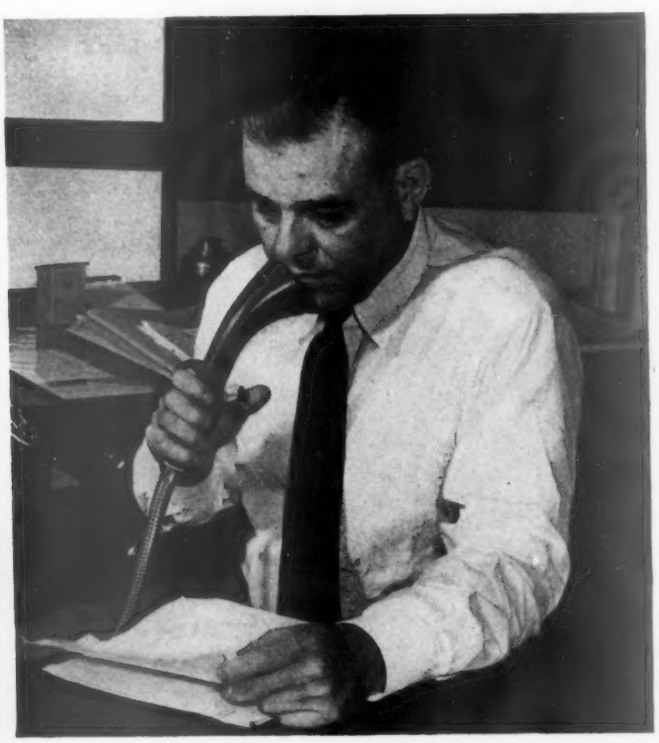
HERBERT E. FLEMING

TO your independent observer these three statements are outstanding pointers for purchasing executives and buyers, and in fact for any business executive, derived from looking into the principles, policies, and methods of Sears, Roebuck and Co., leader in the mail-order and chain-store field. They have been drawn not only from examination of Sears' policies and methods in the purchase of supplies and equipment for the operation of its mail order houses and retail stores but also from getting some idea of those underlying its buying of more than 100,000 items of hard and soft goods for its mail-order and retail store merchandising.

These suggestions, crystallized by the writer from interviews on a phenomenal body of practical experience, may be especially valuable to Purchasing Agents and buyers for manufacturers of goods going to the ultimate consumer. But they contain suggestions also for the industrial Purchasing Agent. They should be stimulating to any purchasing man in position to make recommendations to the overhead management of his company.

Men in other industries lately have become especially interested in the methods of the mail-order and

T. V. HAUSER
Vice President in Charge of Merchandising.



L. C. HODGES
General Purchasing Agent.

Buyers in the Purchasing Department occupy private offices. A secretary is on duty at each buyer's door.

chain-store organizations. One reason for this is found in the fact that many of their executives have been called to Washington for procurement work in the war emergency. This is noted with justifiable pride in a remark by General R. E. Wood, Chairman of the Board, and A. S. Barrows, President, of Sears, Roebuck and Co., in their last annual report to stockholders. After stating that more than 9,300 (today, 11,364) of the company's 79,000 employees are on military leave of absence, they said: "Sears has also been very liberal in lending employees to various agencies of the Federal Government on request where their experience and technical qualifications are needed for the war effort." Among such, besides Donald M. Nelson, Chairman of the WPB, who has addressed the National Association of Purchasing Agents at its last three annual conventions, are several buyers.

Another notation by Chairman Wood and President Barrows for the benefit of stockholders has inspiration for others. They said: "In this year of changing conditions, Sears' veteran-employee organization has once again demonstrated its resourcefulness and ingenuity to cope successfully with new situations." One way in which that resourcefulness has been shown was in the adaptation of retail store space and operations to the selling of relatively more soft goods, in view of the shortage of hard lines caused by the conservation of critical materials for war production, including such production at Sears factories.

Another is reflected in the current 1,228-page catalog, going to approximately 7,000,000 rural and suburban homes. It contains a page on which are listed 215 kinds of hard goods, with illustrations of alumi-

★

Section of display equipment storeroom at Chicago purchasing headquarters.

num cookers, electric irons, lawn mowers, plows, and washing machines, all under a heading saying that this merchandise is not available from this catalog. But it advises readers to look through it for other items to serve their needs, saying, " for Sears have been busy finding worthy alternates for the items that have gone to war." One alternate out of thousands is a rainproof suburban mail box made of lumber and pressed wood plastic instead of metal.

A Gigantic Program

The variety and magnitude of Sears merchandise purchases may be grasped when it is realized that net sales of 1942, although 5.16% less than the all-time high of 1941, were over $867,000,000, and that inventories at the year end, although 15.61% lower, amounted to over $147,000,000. These inventories included merchandise in retail stores, mail order plants, and warehouses; also raw material, work in process and finished merchandise at factories. Normal purchases of supplies, small compared with total purchases of goods for resale, nevertheless amount to many millions of dollars a year.

Sears merchandise buying is for resale through operations at Chicago headquarters, or "parent" departments, a large New York office, and ten mail order houses—at Atlanta, Boston, Chicago, Dallas, Kansas City, Los Angeles, Memphis, Minneapolis, Philadelphia, and Seattle —and 599 retail stores. The stores are rated according to size, as A, B1, B2, B3, and C stores. There are also 223 order offices in rural communities to assist catalog users. In a popular style appendix to the company's 1940 report, entitled "The Story of Sears," General Wood is credited with the chief responsibility for inducing the management to establish a retail system. Figures on division of sales between mail order houses and retail stores are not published, but this story said that in 1933 the retail fledgling of 1924 had passed in total sales volume the old guard mail order sales started in the "gay nineties."

The Purchasing Organization

The buying from manufacturers for retail-store and mail-order resale is carried on by thirty-nine merchandise departments in a major division of the organization under T. V. Houser, Vice President in Charge of Merchandising. The buying of supplies and equipment, under the general direction of G. B. Hattersley, Vice President in Charge of Operations, is carried on by Supplies and Equipment Purchasing Departments under L. C. Hodges, General Purchasing Agent.

Mr. Houser, building on the policy of the late Julius Rosenwald for matching mass production with mass distribution, has brought out most vividly, as quoted in "The Story of Sears" and as amplified in a recent address, the great possibilities of reducing costs and consequently prices to the consumer through buying for mass distribution. He shows, for example, that a man's dress shoe can be manufactured ready for shipment in one and one-half hours of a man's time, but if you take the price ordinarily paid by the consumer and convert the spread into equivalent hours of labor you find that the distribution has required six and one-half man hours, or more than four times as much. He points out that constructive efforts to reduce such spreads do not take anything whatever away from the quality of the shoe or of other manufactured goods.

Small Plants—Big Business

An outstanding feature of Sears' merchandising policy is to buy from small manufacturing plants, situated wherever possible in or near the respective localities of the ten main branch houses in as many commercial centers. That makes for great savings in transportation costs. All told, Sears merchandisers buy from more than 6,000 manufacturing sources. Among those are fourteen factories wholly owned by Sears. These are run under the direction of E. P. Brooks, Vice President in Charge of Factories. Moreover, Sears has a majority or minority interest in many others.

For virtually all from which this company buys it cuts down their cost of distribution, by giving them specifications and styling developed by its Technical and Merchandise Development Laboratories, and by scheduling 95% of their production in many cases for off-season months

Storeroom clerks filling requisitions for forms and other supplies at the Purchasing Department's No. 1 storeroom in Chicago.

when their plants might otherwise be down. For instance, in normal times it buys 150,000 lawn mowers for manufacture by January 1, 160,000 toy trains by May 1, and 350,000 storm windows by June 1.

Mr. Houser finds, from Sears' experience and from behind-the-scenes observation of manufacturing costs, that for efficiency in production "one must turn to the smaller plant, generally in small communities and with the latest equipment," not necessarily the small company, but also large companies with chains of small, decentralized plants, "often with centralized purchasing, engineering and development, and executive control." So it is not surprising that he has been drawn into Paul G. Hoffman's Committee for Economic Development as Vice Chairman of its Industrial Advisory Board, to specialize on postwar planning, especially by small manufacturing concerns.

Mass Distribution

In that connection Mr. Houser is contributing to the country's economic thinking a mental picture of two systems of production and distribution, working in parallel. These, in brief, are:

(1) Mass production by the large manufacturing corporation, with distribution through small dealers;

(2) Mass distribution by the mail order and retail-store chain closely geared to decentralized production by small manufacturing plants.

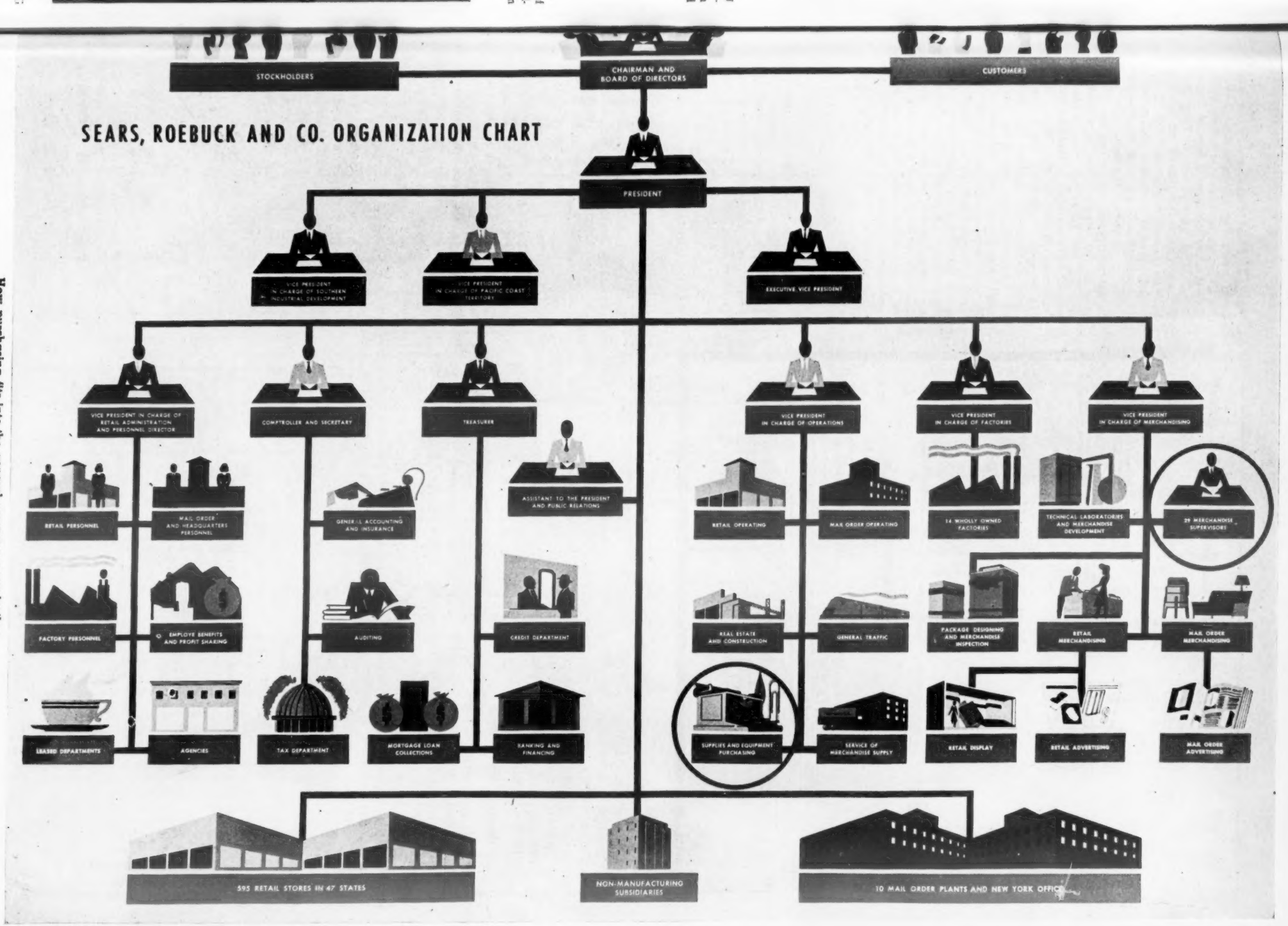
Mr. Houser says that consequently an attack on either mass production or mass distribution is an attack on small business. He holds that under our system of free enterprise, which he predicts will prevail, there is room for both systems—manufacture by large companies plus distribution by small concerns and distribution by large organizations with manufacture by small.

Your observer might add that the customer should benefit by the competition between the two systems. Moreover, the Purchasing Agent or

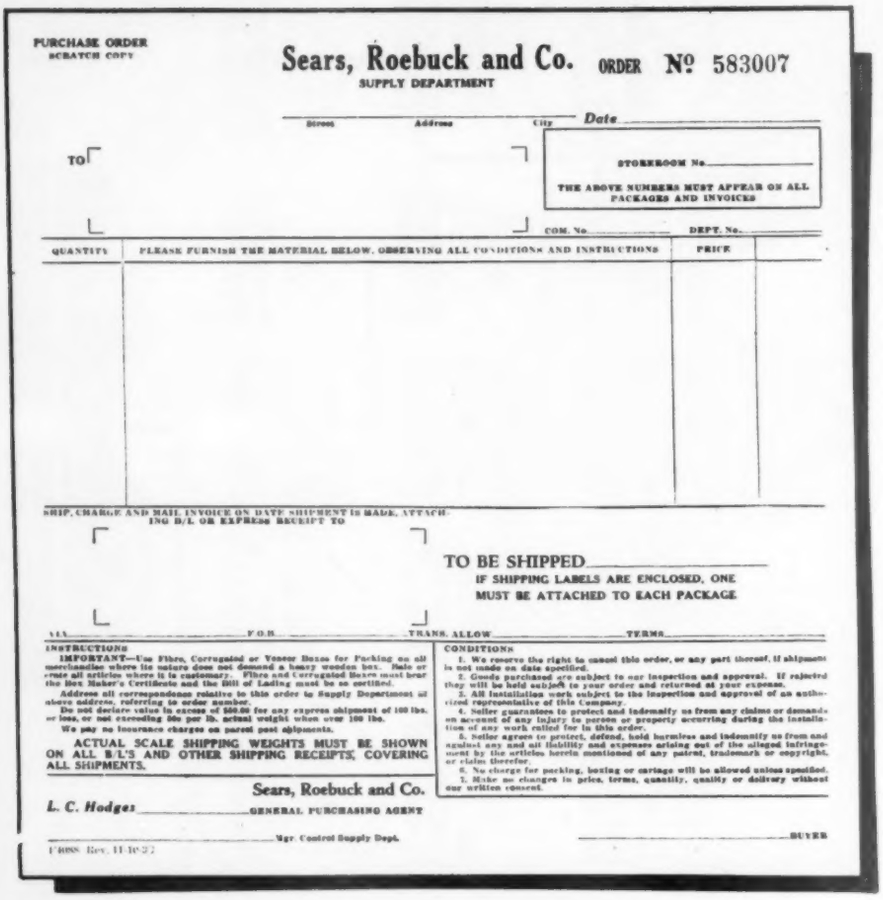
Display case developed by Purchasing Department to promote conservation of office machines and other supplies which cannot be bought for their weight in gold in wartime.

★

Regular training schedules are a part of the Sears system. Here Mr. Houser is addressing a meeting of reorder men from all the mail order plants.



How purchasing fits into the general company organization.



PURCHASE ORDER
SCRATCH COPY

Sears, Roebuck and Co. ORDER Nº 583007
SUPPLY DEPARTMENT

Street Address City Date

TO

STOREROOM No.

THE ABOVE NUMBERS MUST APPEAR ON ALL PACKAGES AND INVOICES

COM. No. DEPT. No.

QUANTITY	PLEASE FURNISH THE MATERIAL BELOW, OBSERVING ALL CONDITIONS AND INSTRUCTIONS	PRICE	

SHIP, CHARGE AND MAIL INVOICE ON DATE SHIPMENT IS MADE, ATTACHING B/L OR EXPRESS RECEIPT TO

TO BE SHIPPED
IF SHIPPING LABELS ARE ENCLOSED, ONE MUST BE ATTACHED TO EACH PACKAGE

VIA F.O.B. TRANS. ALLOW TERMS

INSTRUCTIONS

IMPORTANT—Use Fibre, Corrugated or Veneer Boxes for Packing on all merchandise where its nature does not demand a heavy wooden box. Bale or crate all articles where it is customary. Fibre and Corrugated Boxes must bear the Box Maker's Certificate and the Bill of Lading must be so certified.

Address all correspondence relative to this order to Supply Department at above address, referring to order number.

Do not declare value in excess of $50.00 for any express shipment of 100 lbs. or less, or not exceeding 50c per lb. actual weight when over 100 lbs.

We pay no insurance charges on parcel post shipments.

ACTUAL SCALE SHIPPING WEIGHTS MUST BE SHOWN ON ALL B/L'S AND OTHER SHIPPING RECEIPTS, COVERING ALL SHIPMENTS.

CONDITIONS

1. We reserve the right to cancel this order, or any part thereof, if shipment is not made on date specified.
2. Goods purchased are subject to our inspection and approval. If rejected they will be held subject to your order and returned at your expense.
3. All installation work subject to the inspection and approval of an authorized representative of this Company.
4. Seller guarantees to protect and indemnify us from any claims or demands on account of any injury to person or property occurring during the installation of any work called for in this order.
5. Seller agrees to protect, defend, hold harmless and indemnify us from and against any and all liability and expenses arising out of the alleged infringement by the articles herein mentioned of any patent, trademark or copyright, or claim therefor.
6. No charge for packing, boxing or cartage will be allowed unless specified.
7. Make no changes in price, terms, quantity, quality or delivery without our written consent.

Sears, Roebuck and Co.

L. C. Hodges GENERAL PURCHASING AGENT

Mgr. Control Supply Dept.

BUYER

F4573 Rev. 11-1-27

Purchase Order Form used when issued by a Control Supply Department, i. e., by one of the ten mail order or branch houses. Note that the top sheet is marked "Scratch Copy." Like the top copy of Form F4573, for purchase orders issued at the headquarters supply department, this is used by the buyer in preparing and pencilling the information to be used by the typist in writing the order.

Of the four typed copies the No. 1 copy goes to the vendor. This is signed not only by the buyer but also, under the printed signature of L. C. Hodges, General Purchasing Agent, by the "Mgr. Control Supply Dept.," ordinarily the Purchasing Agent at the branch house. The contractual instructions and conditions are the same as on the purchase order issued from the headquarters department in Chicago. The No. 2 typed copy is the record copy for the Control Supply Department; the No. 3 copy is for the receiving store, either a retail store or the branch house issuing the order; the No. 4 copy is marked "Dept. 806 Copy," which means that it goes to the headquarters offices of the General Purchasing Agent in Chicago.

the buyer, in fact anyone directly or indirectly in production or distribution activities, may get from the mental picture of the two systems a clearer understanding than he previously had of his own place in the nation's business.

Buying for Resale

In the Sears organization there are, at Chicago, under Mr. Houser as Vice President in Charge of Merchandising, besides a group of some forty in the general merchandising office, eight main units; 29 Merchandise Supervisors, Technical Laboratories and Merchandise Development, Package Designing and Merchandise Inspection, Retail Merchandising, Retail Display, Retail Advertising, Mail Order Merchandising, Mail Order Advertising.

The twenty-nine Merchandise Supervisors are executives responsible for activities involved in buying thirty-nine lines or groups of lines for both mail order and retail store selling. Some are responsible for several activity units.

While the unit organizations under the Merchandise Supervisors for these buying activities vary somewhat, the typical set-up is a secretary, a group of buyers, a retail sales manager, a mail order salesman, a catalog copy man, and clerical assistants. The total number of buyers, assistant buyers, junior buyers, and assistants to buyers is over two hundred. Besides these forces at Chicago, many of the Merchandise Supervisors have buyers in the New York office.

The title "Supervisor" in many organizations is equivalent to foreman or even to straw boss of a section. It means much more in the Sears set-up. That the Merchandise Supervisor under the Vice President in Charge of Merchandising must be a high-power executive is indicated by the following description of his qualifications in "The Story of Sears":

"Today the Sears merchandise supervisor, which is the company's intra-mural nomenclature for the executive head of one or more merchandise departments, needs to possess the best qualities of a first rate economist, a better-than-yeoman statistician, a pundit of mass psychology, and preferably he should glow with the aura of the crystal-gazer.

"He must see that his inventories stay in nice adjustment to such mysterious factors as probable demand based on the probabilities of public buying power, raw material and manufacturing costs, abrupt shifts in popular taste and prejudice, any far reaching event which might affect the nation's economy.

"He must be something of an engineer, at least enough of one to interpret technical reports and pass judgment upon the physical and mechanical excellence of his lines. He must know enough about manufacturing to determine if he is buying at the right price, enough about marketing to determine if he is selling at the right price.

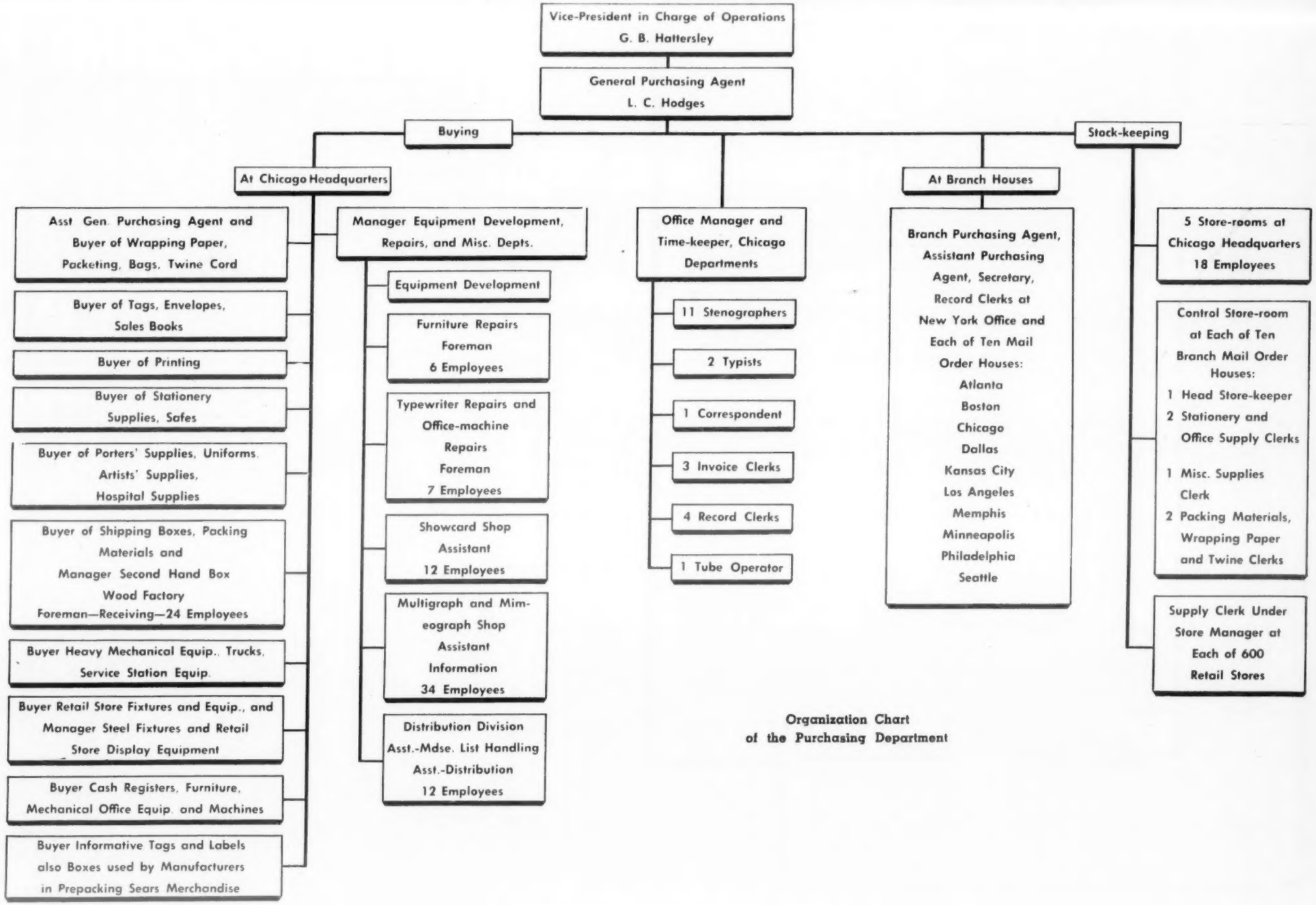
"As far as his own lines are concerned, he must know all there is to know about where raw materials are produced, where they are processed, where the merchandise is manufactured, where, why and how the finished product is sold."

That sets forth a standard of qualifications by which any ambitious merchandise buyer and also any ambitious Purchasing Agent or supply buyer might well measure his own. For in these days, and the days ahead, it is important that he look beyond operation, beyond production, and do his part in reducing the costs of distribution.

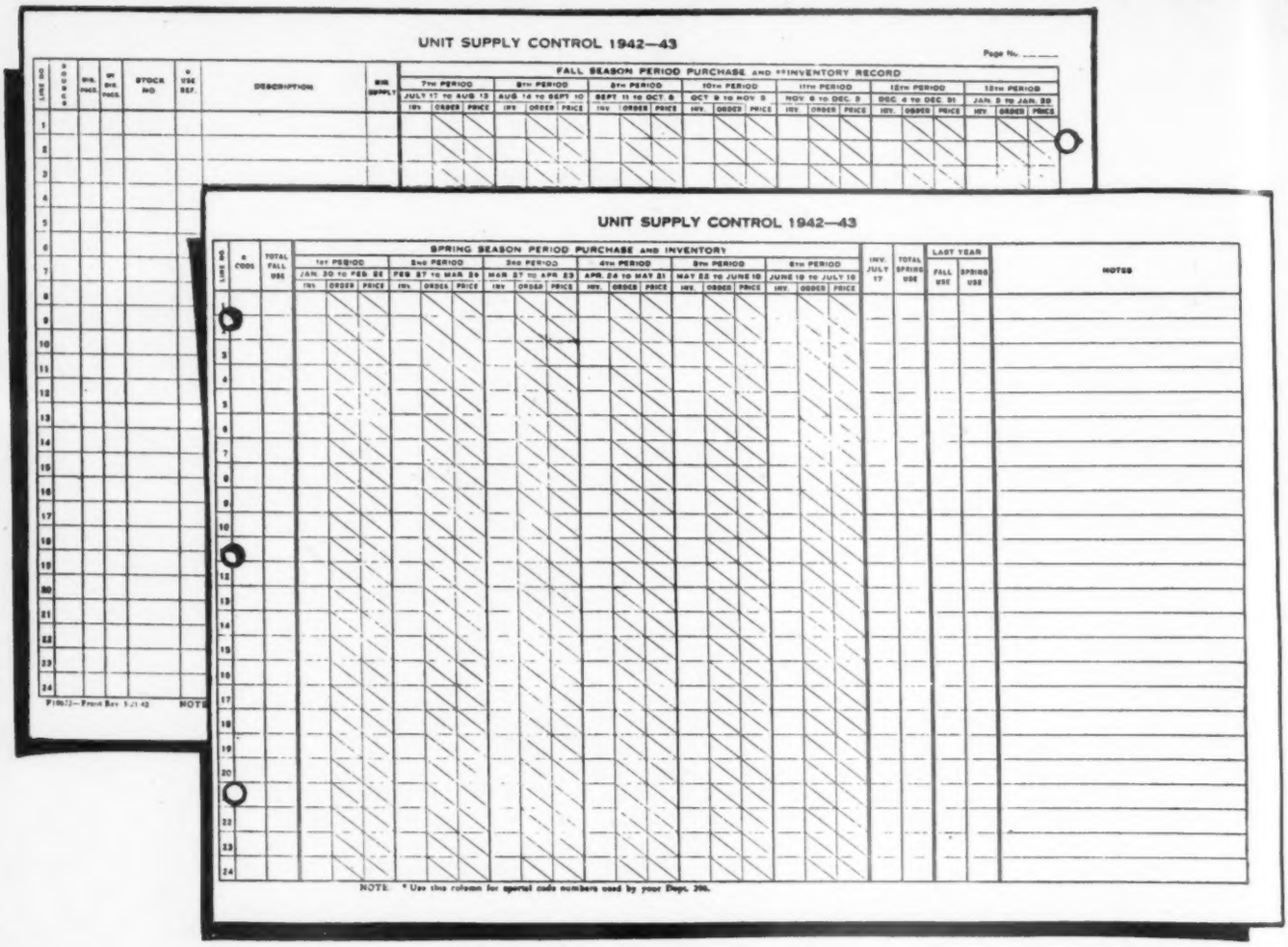
Policies of Supply

At Sears, as Mr. Houser pointed out to your interviewer, there is considerable collaboration between buyers in merchandise departments and buyers in the supplies and equipment purchasing departments. This, however, is not so extensive as might be expected, because of differences in packaging requirements for products going to ultimate consumers and those going to mail order houses and retail stores.

But the Sears merchandising spirit and policies are influential in the activities of the departments under Mr. Hodges, the General Purchasing Agent. Answering a question on this point, he said: "Everyone in the whole Sears or-


Vice-President in Charge of Operations
G. B. Hattersley
General Purchasing Agent
L. C. Hodges
Buying
Stock-keeping
At Chicago Headquarters
At Branch Houses
Asst Gen. Purchasing Agent and Buyer of Wrapping Paper, Packeting, Bags, Twine Cord
Buyer of Tags, Envelopes, Sales Books
Buyer of Printing
Buyer of Stationery Supplies, Safes
Buyer of Porters' Supplies, Uniforms, Artists' Supplies, Hospital Supplies
Buyer of Shipping Boxes, Packing Materials and Manager Second Hand Box Wood Factory Foreman—Receiving—24 Employees
Buyer Heavy Mechanical Equip., Trucks, Service Station Equip.
Buyer Retail Store Fixtures and Equip., and Manager Steel Fixtures and Retail Store Display Equipment
Buyer Cash Registers, Furniture, Mechanical Office Equip. and Machines
Buyer Informative Tags and Labels also Boxes used by Manufacturers in Prepacking Sears Merchandise
Manager Equipment Development, Repairs, and Misc. Depts.
Equipment Development
Furniture Repairs Foreman 6 Employees
Typewriter Repairs and Office-machine Repairs Foreman 7 Employees
Showcard Shop Assistant 12 Employees
Multigraph and Mimeograph Shop Assistant Information 34 Employees
Distribution Division Asst.-Mdse. List Handling Asst.-Distribution 12 Employees
Office Manager and Time-keeper, Chicago Departments
11 Stenographers
2 Typists
1 Correspondent
3 Invoice Clerks
4 Record Clerks
1 Tube Operator
Branch Purchasing Agent, Assistant Purchasing Agent, Secretary, Record Clerks at New York Office and Each of Ten Mail Order Houses:
Atlanta
Boston
Chicago
Dallas
Kansas City
Los Angeles
Memphis
Minneapolis
Philadelphia
Seattle
5 Store-rooms at Chicago Headquarters 18 Employees
Control Store-room at Each of Ten Branch Mail Order Houses:
1 Head Store-keeper
2 Stationery and Office Supply Clerks
1 Misc. Supplies Clerk
2 Packing Materials, Wrapping Paper and Twine Clerks
Supply Clerk Under Store Manager at Each of 600 Retail Stores

Organization Chart of the Purchasing Department



Unit Supply Control Form for purchase and inventory records, made out at each retail store under the directions of the General Purchasing Agent. The left hand page covers the Fall Period, and the right hand page covers the Spring Period.

ganization is a customer to us in the supply and equipment purchasing end. With merchandise, when a store is out of one item, often the customer can meet his requirements with another. But on many supply items that is not possible. They are bottle neck items. For example, if a store runs out of order-entry ticket forms it and we would have a tough time, one of our buyers would have to stay on the job as long as necessary to meet that sort of a situation, which we of course aim to prevent."

Purchasing Responsibility

The Sears General Purchasing Agent is responsible not only for the buying but also for the stock-keeping of eleven kinds of supplies and equipment required for maintenance and operation of the mail order branches and retail stores throughout the country. The items involved include 6,000 different printed or duplicated forms, 500 packing materials, office machines, display equipment, tailor shop tools, porters' supplies, service station equipment, coal, oil, and thousands of others.

The organization under the General Purchasing Agent as supervisor or executive head of several numbered departments is shown in the accompanying chart, compiled for this article. At the parent offices and buildings in Chicago there are the main supplies department, including ten buyers, their secretaries and supporting office workers, six departments concerned with equipment development, repair and manufacture, and five store-rooms. At the New York office and each of the ten branch mail order houses there are purchasing and stores control groups. At each retail store, under the store manager, there is at least one stock-keeper and supply clerk receiving guidance from the General Purchasing Agent's headquarters.

The main supplies and equipment purchasing department at Chicago has 54 employees; the six other departments and store-rooms there have 95. The typical buying unit in a branch mail order house comprises a purchasing agent, an Assistant Purchasing Agent, a secretary, a typist, and two record clerks. The stock-keeping unit at each mail order branch includes a head store-room man, one stationery and office supply man, and one for retail store items. Retail stores order many of their supplies from the nearest mail order branch house, thus cutting the cost of the transportation factor in distribution.

Developing Supply Sources

The example of the merchandising division of Sears in developing manufacturers and placing off-season orders for mass production with Sears' factories and with other decentralized plants is followed in the procurement of supplies and equipment. The General Purchasing Agent's departments do not include a printing shop for regular printing from type, but they do include a mimeograph and multigraph shop, in which 34 workers turn out a huge volume of duplicated material, some of it containing pictures and drawings. Moreover, just as the merchandising department has guided many small manufacturers, so the General Purchasing Agent has de-

veloped as a source of mass buying of envelopes a small envelope company in Southern Illinois, from which mail order branches and retail stores order directly.

Through the years, too, the General Purchasing Agent's buyers have built up sources of supply in the same way that the merchandise buyers have done. Some of the items on which sources are of long standing are as follows: Bags used in packing soft line goods, 25 years; wrapping paper, 15 years; boxes, 20 years.

"Our long association with many of our suppliers is paying dividends now," said Mr. Hodges. "It is most helpful in these days when you buy what you can get where you can get it."

A second-hand-box factory is one of the headquarters departments. Its manager is the buyer of shipping boxes and packing materials. In this department 24 employees work on crating, boxes, and miscellaneous displays. Equipment development is another feature of the headquarters activities. This includes creation of equipment used in displays at retail stores. As a result there is at Chicago a unique display room containing mannikins and other pieces used on the floors and in the windows in store retailing.

Some of the supply buying done in Chicago is for the company's fourteen factories, although each factory has its own Purchasing Agent. One of the buyers purchases informative tags and labels, also boxes, used by manufacturers in preparing Sears merchandise.

In the same way that merchandise buyers consult the Sears technical and testing laboratories for tests to assure the quality of their purchases, so do the supply buyers. Among such check-ups have been crushing tests of boxes, comparative tests of mechanical equipment, construction tests of furniture, and endurance tests of paper, twine and floor brushes.

Training Buyers

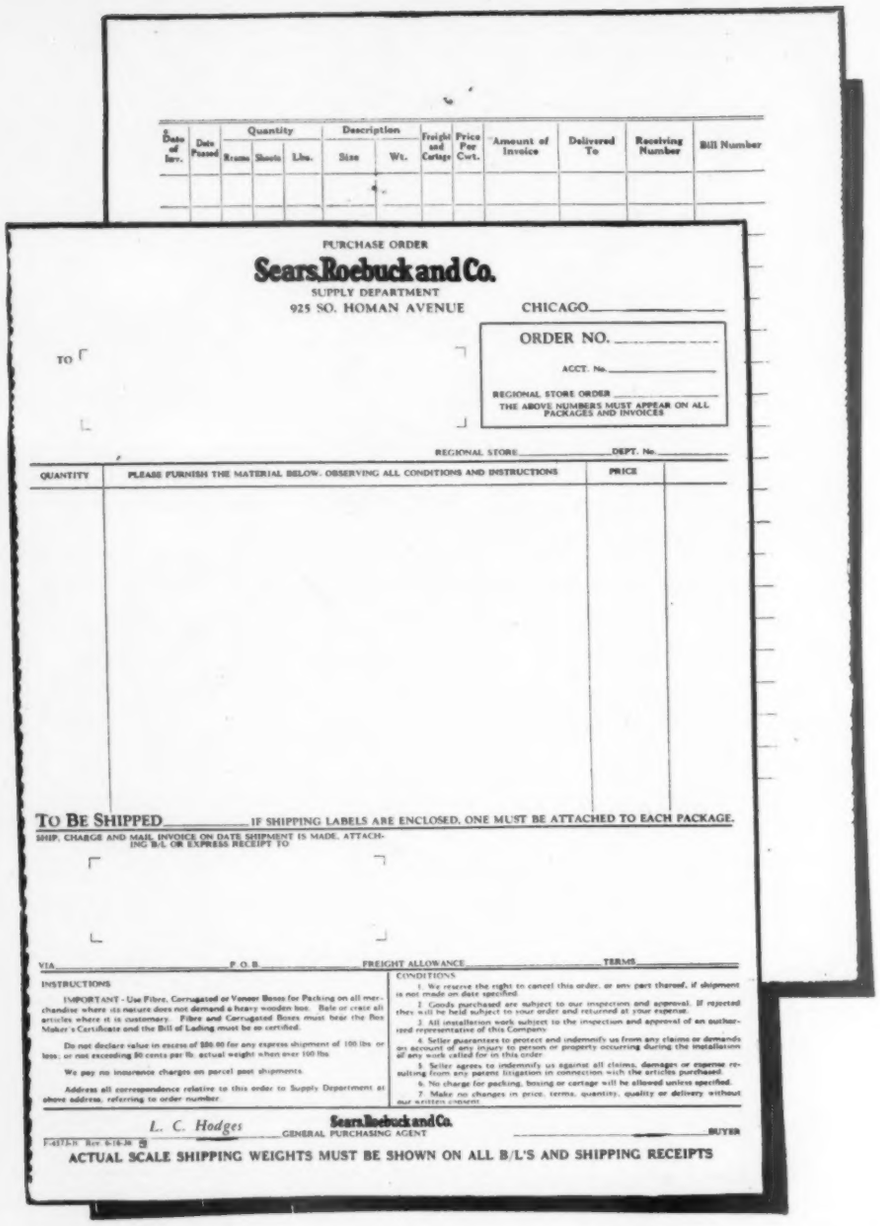
Banking on the self-reliance of the buyers in the supplies purchasing headquarters at Chicago and of the Purchasing Agents at the branches, as with the merchandise supervisors and buyers, is a notable feature of Sears management policies.

"Our experience shows that the first thing for success in buying supplies and equipment is to have an organization of the right kind of people," said Mr. Hodges. "The buyers have to be honest, to know their lines completely, and then be given authority and held responsible for keeping supplies in the storerooms and costs in line. I don't countersign any purchase orders. The buyers' signatures are enough. All the executives I have worked under gave me leeway; what they want is results. That's what we get from our buyers, even if they have to stay on a job twenty-four hours to put it through."

None of the buyers of equipment and supplies under Mr. Hodges came to Sears as a professional Purchasing Agent who had received his training elsewhere. Moreover, even though collaboration with the merchandising departments is close, none of these buyers was transferred from merchandise buying to supply buying. All were developed in the supplies purchasing and stock-keeping departments. The buyer for porters' supplies, for example, got his start in a stock room. Before getting a rating as buyers, virtually all were assistant buyers. This development of the buyers is according to a Sears' policy of promotions within the organization.

The experiences of Mr. Hodges since 1918, when he started as an office boy in the branch house at Dallas, Texas, are an illustration. During his first ten years he was sucessively in charge of the store-

Requisition Form, made out in quadruplicate. The first, second and third copies go from the retail store to the nearest mail order house, which is its branch control store. Copy No. 1 goes to its auditing department to be charged to the store; copy No. 2, to its records department for filing according to retail stores; copy No. 3, packed with the merchandise and sent to the retail store, showing quantity and cost. Copy No. 4 is held by the retail store to use in checking on receiving shipment, and to pass on to the supply department.



PURCHASE ORDER

Sears Roebuck and Co.

SUPPLY DEPARTMENT
925 SO. HOMAN AVENUE CHICAGO

TO

ORDER NO.
ACCT. No.
REGIONAL STORE ORDER
THE ABOVE NUMBERS MUST APPEAR ON ALL PACKAGES AND INVOICES

REGIONAL STORE DEPT. No.

Date of Inv.	Date Passed	Quantity: Reams	Quantity: Sheets	Quantity: Lbs.	Description: Size	Description: Wt.	Freight and Cartage	Price Per Cwt.	Amount of Invoice	Delivered To	Receiving Number	Bill Number

QUANTITY	PLEASE FURNISH THE MATERIAL BELOW, OBSERVING ALL CONDITIONS AND INSTRUCTIONS	PRICE

TO BE SHIPPED IF SHIPPING LABELS ARE ENCLOSED, ONE MUST BE ATTACHED TO EACH PACKAGE.

SHIP, CHARGE AND MAIL INVOICE ON DATE SHIPMENT IS MADE. ATTACHING B/L OR EXPRESS RECEIPT TO

VIA F. O. B. FREIGHT ALLOWANCE TERMS

INSTRUCTIONS

IMPORTANT - Use Fibre, Corrugated or Veneer Boxes for Packing on all merchandise where its nature does not demand a heavy wooden box. Bale or crate all articles where it is customary. Fibre and Corrugated Boxes must bear the Box Maker's Certificate and the Bill of Lading must be so certified.

Do not declare value in excess of $50.00 for any express shipment of 100 lbs or less; or not exceeding 50 cents per lb. actual weight when over 100 lbs.

We pay no insurance charges on parcel post shipments.

Address all correspondence relative to this order to Supply Department at above address, referring to order number.

CONDITIONS

1. We reserve the right to cancel this order, or any part thereof, if shipment is not made on date specified.
2. Goods purchased are subject to our inspection and approval. If rejected they will be held subject to your order and returned at your expense.
3. All installation work subject to the inspection and approval of an authorized representative of this Company.
4. Seller guarantees to protect and indemnify us from any claims or demands on account of any injury to person or property occurring during the installation of any work called for in this order.
5. Seller agrees to indemnify us against all claims, damages or expense resulting from any patents litigation in connection with the articles purchased.
6. No charge for packing, boxing or cartage will be allowed unless specified.
7. Make no changes in price, terms, quantity, quality or delivery without our written consent.

L. C. Hodges GENERAL PURCHASING AGENT

Sears Roebuck and Co. BUYER

F-6373-D Rev. 6-16-39

ACTUAL SCALE SHIPPING WEIGHTS MUST BE SHOWN ON ALL B/L'S AND SHIPPING RECEIPTS

Purchase Order Form used by the headquarters supply department at Chicago. The top copy, on stout paper, is a separate "scratch copy" for the buyer's use in making the entries for the order typist to follow. The four typed copies for issuance and recording are on thin paper from perforated rolls.

The No. 1 copy goes to the vendor; No. 2 copy to the branch control store in the region of the retail store concerned; No. 3 copy to the retail store for matching up with the invoice and forwarding to the Control Store. No. 4 copy is the headquarters supply department record. On all working copies, the space showing "Instructions" and "Conditions" is used for a ruled form for appropriate record entries. The back of the No. 4 copy contains a complete record of the transaction. This form is used both for entering into contracts and for individual orders.

room there, then buyer of stationery and supplies, then branch store Purchasing Agent. In 1928 he was transferred to Chicago to buy printing, tags and envelopes, which he did until 1935. Then for eight months he was out in retail stores in training for store management, but an automobile accident, resulting in a pair of broken legs, prevented the walking around required of a store manager and caused his return to the purchasing offices. In 1936 he was made manager of the show card shop, multigraph and mimeograph shop, and distribution division. In 1939 he was promoted to General Purchasing Agent, the fourth in the company's history.

Alternates and Conservation

Due to the shortages in critical materials needed for the war effort, the Sears buyers of supplies and equipment, like others, and like merchandise buyers, have had to show resourcefulness in procuring substitutes, or, as the Sears catalog says, "alternates."

"But our job in these times has been more or less promotional—getting the information about critical materials around to the people at the mail order houses and the retail stores," said Mr. Hodges. "Many of them don't realize that supplies are hard to get."

In pushing the promotional work, Mr. Hodges credits his buyers with having worked up an ingenious display case. This came about when he mentioned to them that he had seen in a business magazine a statement that today a paper clip is a "jewel." The buyers put their heads together and developed the display set-up shown in the photograph accompanying this article. Note that this is topped with a list, on a board over a V and under an American eagle, reading: "In the Service of Our Country: Rubber cement, ditto carbon, erasers, pins, typewriters, rubber bands, ribbon spools, jute rope, mechanical pencils, adding machines, staples, twine, clips, metal fasteners, thumb tacks, pen points, ring knives, calculators."

Another promotional activity was a company-wide supply savings campaign, conducted in the fall of 1941. In that, $2,500 in war bonds were given as prizes for suggestions. There were 6,500 entries and 10,000 suggestions. It was estimated that a reduction of 150 tons in the paper and board used in a year was brought about.

One wartime method of saving was in connection with pins, which are used in many of the steps of the famous schedule system, under which all mail orders from customers move along on a predetermined time schedule. Experiments with cactus thorns, plastics, glass, tooth picks, and golf tees did not yield satisfactory substitutes. To salvage pins dropped on floors, sweepers containing magnets were introduced. They pick up clips and pins. For the handling of such hard goods as are available at retail stores, new hardware bags, with firm bottoms, were developed to take the place of bags suitable for soft goods.

The Supply Catalog

For year-in year-out promotion work, the Sears General Purchasing Agent issues a "Supply-Equipment Catalog and Manual," just as the merchandising division uses the well known catalog in mail-order selling. But in sending his catalog to store managers, Mr. Hodges tells them it should be distinctly understood that it is not the purpose of this catalog

How to get MAXIMUM EFFICIENCY from your LIGHTING EQUIPMENT

Cleanliness, proper maintenance, and a high reflection factor in the painting of walls and ceilings, help to provide lighting that makes for efficient production conditions

By

JOHN J. NEIDHART

Westinghouse Electric & Mfg. Co.

MAXIMUM efficiency without sacrifice of quality has always been a goal and byword of American industry. In the past, peak efficiency has meant only greater profits and improved consumer goods at lower prices. Today, however, efficiency has taken on a new and much more important meaning, for the more quickly and efficiently our plants produce the vital material needed to supply our fighting forces, the sooner we will achieve our goal—Victory.

If we examine the different ways that productive efficiency may be increased, we soon learn that high levels of proper quality illumination enable workers to produce more goods with less effort. Although it is essential that the lighting installation be carefully designed to obtain the best results, we shall not discuss the design of the lighting system but shall instead see how we may obtain optimum operating efficiency of any lighting installation.

The efficiency of any given lighting installation is dependent upon two things: (1) the painting of all surrounding surfaces which might absorb some of the light, and (2) the maintenance of the lighting equipment.

Wall Treatments

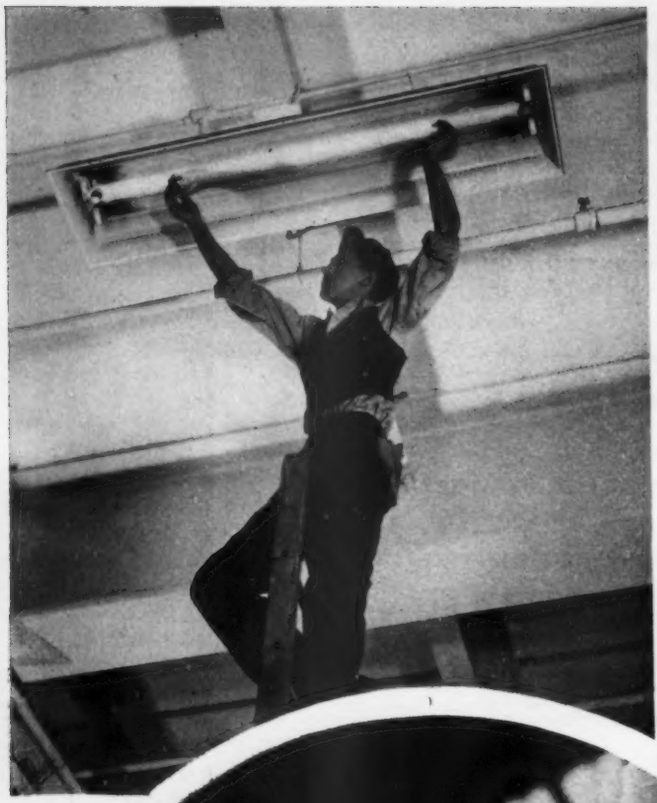
High reflection factor, matte or semi-matte surfaces, are essential for maximum utilization and diffusion of the light. Ceilings, walls, trusses, columns and machinery may absorb a considerable percentage of the light if their surfaces are not painted a light color; causing most of the light striking the surface to be reflected, increasing the amount of light reaching the working plane. Selection of the paint to be used should be governed by the following requisites:

Reflectivity—High reflection factors lead to high efficiencies, and it is, therefore, desirable to paint all ceilings, walls, trusses and columns with a paint having a reflectivity of 75 per cent or better except for a darker wainscot below the working plane. Although it is not possible to maintain this high reflection factor for an extended period of time in factory areas having a dirty or oily atmosphere, the reflectivity will at all times be higher than if it had been low initially. The reflectivity can always be restored to its initial value, of course, by repainting or by washing.

Finish—Glossy finishes should be avoided, for the resulting specular reflections of the light sources will cause annoying glare. A matte finish is most desirable in clean areas since it will provide for greatest diffusion of the light and will completely eliminate specular reflections. A

Take down lamps and reflector for cleaning at regular intervals.

Wash reflector thoroughly with soap and water.



Wash lamps thoroughly before replacing. Top, left.

Lowering a luminaire to the floor where it may be cleaned more conveniently is quickly accomplished with the aid of an automatic disconnecting hanger in this high bay area.

Removable reflectors make it possible for the maintenance man to remove a dirty reflector and replace it with a clean one that is carried as an extra. He then washes the dirty reflector on the floor and repeats the procedure at the next luminaire, replacing the dirty reflector with the one he has just washed. This saves him one trip up and down the ladder at each luminaire.

High reflection factor, white surfaces help diffuse the light and improve the efficiency of the fluorescent installation in this manufacturing and repair shop.

semi-matte or egg shell finish is usually more satisfactory, since it has a smoother surface which does not collect dirt as easily as does the relatively rough surface of a matte finish.

Durability—In every factory, the reflectivity and appearance of the paint may eventually be impaired by dust and dirt collection. It is, therefore, advisable to select a paint which is moisture resistant and levels out to a smooth continuous film which is resistant to soiling and may be washed frequently with soap and water. If the painted surfaces are exposed to vapors and gases, special fume and moisture-resisting paint should be employed.

Color—In general, all surfaces except the machinery should be painted white since white has a higher reflectivity than any color and helps create a bright, cheerful atmosphere. White paints are often tinted slightly with blues or yellows, but tests have indicated that the natural or warm whites depreciate less with age than do the blued whites. Slightly blued whites are often the most desirable, however, when used with incandescent or 3500° white fluorescent lamps since the blue tint will tend to be color-corrective and provide a more balanced, nonchromatic white light. The machinery may be painted a medium gray, but tests have shown that visibility and safety may be enhanced by painting the working area of the machine a lighter, contrasting color such as buff or cream.

High reflection factor surfaces will increase illumination and also provide for better diffusion of the light, minimize shadows, reduce harsh shadows between the light sources and the surroundings, improve seeing comfort and prevent the illumination from dropping off near the walls or around large columns.

A worker should never be forced to look up into dark surroundings when he raises his eyes from his work, for it will have a detrimental effect upon his eyes and lead to defective eyesight. When a person shifts his eyes from a bright area to a dark one, his eyes must readapt themselves to the different intensity. The eyes accomplish this by two means: (1) the pupil becomes larger to admit more light, and (2) the retina becomes more sensitive to light. When the person looks back at his work, his eyes must go through this same procedure in reverse. Since a worker looks up rather frequently to rest his eyes by allowing them to focus on a more distant object, it is important that he look up into light surroundings.

Scientific research has shown, for example, that 12 per cent less work was done when the eyes alternated between two brightnesses, one of which was 100 times greater than the other, than when the brightness was uniform. Furthermore, light surroundings create a more cheerful atmosphere and improve worker morale. Dark walls and surroundings, on the other hand, have the same effect as a dark gloomy day and tend to depress people who work within them.

Before and after checks on the illumination in various factories have proved that the illumination may be increased 100% or more by proper painting alone. For example, an Ohio manufacturer found that the illumination in his factory was increased from 5 footcandles to 15 footcandles by merely repainting all interior surfaces to prevent light absorption. Benefits resulting from such an increase in illumination become even more significant when one considers that it does not include the more intangible benefits of better diffusion and improved seeing comfort.

The Maintenance Program

Maintenance departments of all factories should devote special attention to the care of lighting installations. Planned maintenance will assure peak efficiency and prolong the useful life of the lighting equipment. The best 50 footcandle installation is no better than a comparable 20 footcandle installation if burned out lamps are not replaced and the reflectors are not kept clean, reducing illumination to a fraction of its designed *maintained* value.

A well-planned maintenance program divides itself into two phases: (1) the *cleaning* of the lighting equipment and reflecting surfaces to remove dust and dirt, and (2) the *relamping* of the luminaires immediately after lamp burnouts or on a systematic lamp replacement plan.

Cleaning—The permissible time between cleanings is peculiar to each installation since the rate of decrease in light output varies with the type of lighting equipment and the amount of dust and dirt in the air. Dust tight covers will simplify the maintenance problem considerably in extremely dirty atmospheres such as are prevalent in foundries. The best method of establishing a cleaning schedule for any installation is to make periodic checks of the illumination with a light meter. The length of time required for the illumination to drop to approximately two-thirds of its initial value may be arbitrarily taken as a satisfactory cleaning period in most cases. This period may be as short as 3 or 4 weeks in extremely dirty locations, but it will usually be from 2 to 6 months under average conditions.

When luminaries are cleaned, all reflecting surfaces and glass covers should be thoroughly washed with

(*Continued on page 220*)

Visibility and lighting efficiency are greatly enhanced by the white ceiling and columns in the machine shop shown here.

How to PREPARE A BILL OF MATERIALS

Revised instructions on CMP procedure are issued by War Production Board

A NEW set of instructions has been compiled by the War Production Board covering the preparation of the bills of materials required by Claimant Agencies for the over-all calculation of material requirements. It is again emphasized that the successful operation of the Controlled Materials Plan basically depends on the accuracy of these bills, upon which the allotments of materials are calculated. Understatement of requirements will result in shortages for the completion of a manufacturing program, and overstatements may result in a reduction of manufacturers' production schedules below a level which could otherwise have been authorized.

A bill of materials is a statement of the materials required to produce a given product, assembly, subassembly, or part. A Detail Bill of Materials shows all the materials required for each individual part of the product. A summary Bill of Materials indicates the total quantities of each CMP material required for fabrication of the product and, in addition, the time when the various materials are required ("lead time") in order for the manufacturer to meet his production schedule.

Requests for bills of materials originate with a Claimant Agency or with an Industry Division of the War Production Board, the type of bill—Detail or Summary—being designated in the request. These requests are made to prime consumers, who receive their CMP allotments of controlled materials from such Agency or Division. Prime consumers must then request from their secondary consumers the necessary bills of materials for the parts or assemblies which the latter supply, and they in turn will similarly request bills of materials from their suppliers.

In the absence of contrary instructions, both Detail and Summary Bills will exclude the material for the fabrication of Class B components of the product, since manufacturers of Class B items are themselves prime consumers who normally receive their CMP allotments from Industry Divisions of WPB. However, Claimant Agencies may request bills of materials on Class B end products or components of their major repetitive programs. When a *Complete* Bill of Materials is requested, material requirements for Class B components must also be obtained. The material required for components which are Government Furnished Equipment (GFE) will always be excluded, even from "complete" bills, although the items themselves, as well as Class B components, must be listed on Form CMP-3.

Normally, the prime consumer will request only Detail Bills of Materials from his secondary consumers, regardless of the type bill he himself is requested to furnish. Requests for Complete Bills of Materials shall be made only when the Claimant Agency or Industry Division has requested a Complete Bill from the prime consumer.

What is Included

A bill of materials shall include only those materials directly incorporated in the finished product, including, for example, material used in packaging when specified as an integral part of the product, as distinguished from a shipping container. Materials that are indirectly used in the manufacturing process, such as abrasives, lubricants, coolants, operating and testing supplies, shipping containers, etc., should not be included. Material used in plating, coating, or galvanizing will not be separately listed, but the description of the plated, coated or galvanized part should indicate that it has so been treated, and the weight of the material shown should include the plating, coating, or galvanizing.

The bill of materials, whether of the Detail or Summary type, should represent an accurate statement of material requirements based on an engineering parts list or other equivalent analysis of the product. In special cases, where an accurate statement of material content would be impractical or unreasonably burdensome, the manufacturer may arrange with the Claimant Agency or Industry Division to use one of the following approximation methods:

(a) *Engineering estimate.* When relatively small quantity production is involved, or no precise data are available from past experience, an engineering estimate of the weights of materials required may be submitted.

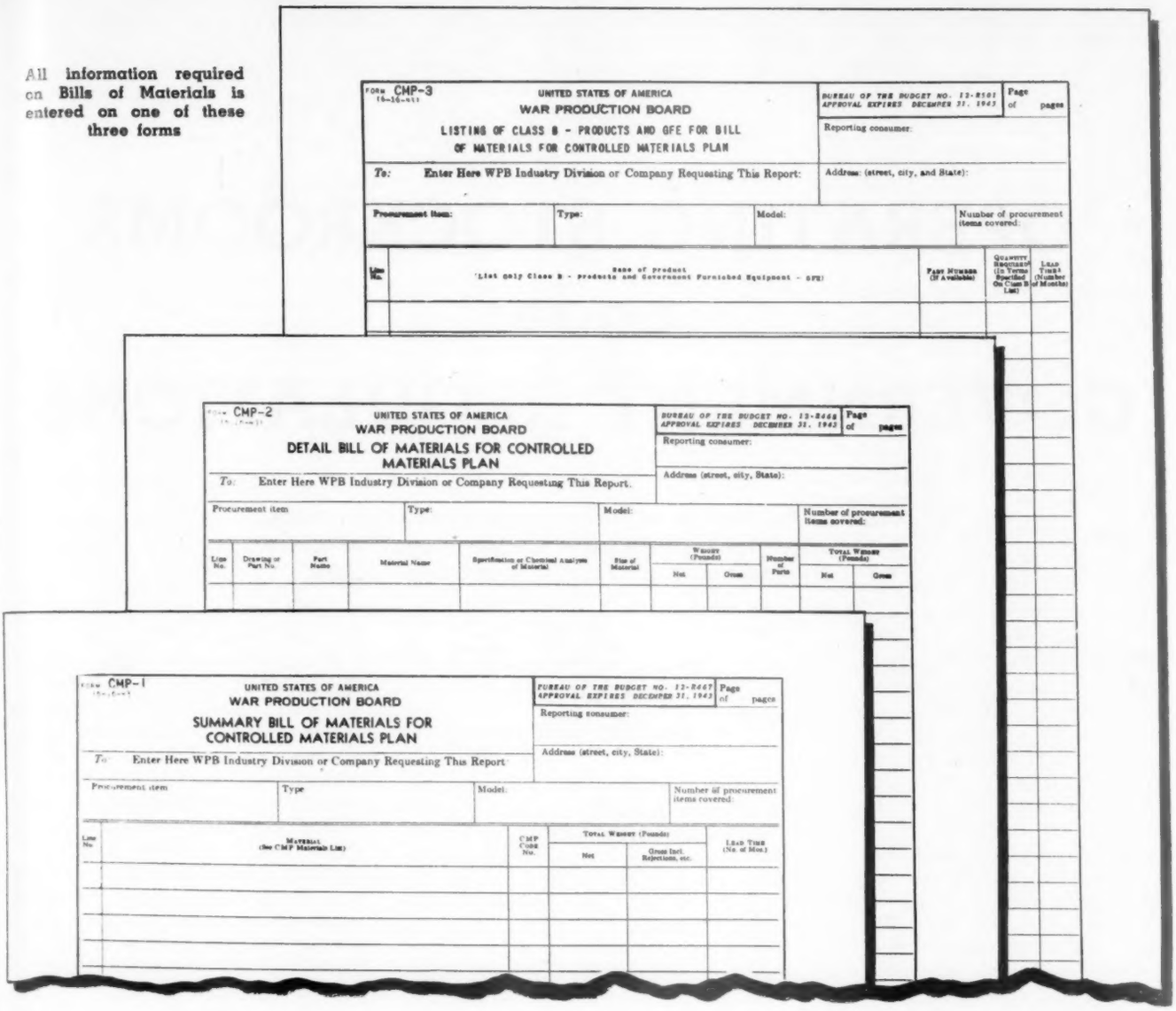
(b) *Approximation for items of small unit weight.* In the case of small parts such as screw machine products, small stampings, etc., the approximate weights of the constituent materials may be acceptable.

(c) *Estimates based on dollar value or other units of evaluation.* Where the basic characteristics of a related group of products are comparable, the material content may be determined through the development of conversion factors relating material content to dollar value, total horsepower, weight, or other appropriate unit of measure.

(d) *Prototype Bill of Materials.* This is a bill of materials, either Detail or Summary, of a representative or typical unit in a product line which may be accepted as a statement of material requirements for similar units in the line within a specified range of designs, sizes, or performance ratings.

Extra parts, such as extra wheels and tires on trucks, and other auxiliary or accessory equipment such as picks, shovels, fire extinguishers, tool kits, etc., on tanks.

All information required on Bills of Materials is entered on one of these three forms



FORM CMP-3 (6-16-43)

UNITED STATES OF AMERICA
WAR PRODUCTION BOARD
LISTING OF CLASS B - PRODUCTS AND GFE FOR BILL OF MATERIALS FOR CONTROLLED MATERIALS PLAN

BUREAU OF THE BUDGET NO. 12-R101 APPROVAL EXPIRES DECEMBER 31, 1943 | Page of pages

Reporting consumer:

To: Enter Here WPB Industry Division or Company Requesting This Report:

Address: (street, city, and State):

Procurement Item: | Type: | Model: | Number of procurement items covered:

Line No. | Name of product (List only Class B - products and Government Furnished Equipment - GFE) | Part Number (If Available) | Quantity Required (In Terms Specified On Class B List) | Lead Time (Number of Months)

FORM CMP-2 (6-16-43)

UNITED STATES OF AMERICA
WAR PRODUCTION BOARD
DETAIL BILL OF MATERIALS FOR CONTROLLED MATERIALS PLAN

BUREAU OF THE BUDGET NO. 12-R448 APPROVAL EXPIRES DECEMBER 31, 1943 | Page of pages

Reporting consumer:

To: Enter Here WPB Industry Division or Company Requesting This Report.

Address (street, city, State):

Procurement item | Type: | Model: | Number of procurement items covered:

Line No. | Drawing or Part No. | Part Name | Material Name | Specification or Chemical Analysis of Material | Size of Material | Weight (Pounds) Net | Weight (Pounds) Gross | Number of Parts | Total Weight (Pounds) Net | Total Weight (Pounds) Gross

FORM CMP-1 (6-16-43)

UNITED STATES OF AMERICA
WAR PRODUCTION BOARD
SUMMARY BILL OF MATERIALS FOR CONTROLLED MATERIALS PLAN

BUREAU OF THE BUDGET NO. 12-R447 APPROVAL EXPIRES DECEMBER 31, 1943 | Page of pages

Reporting consumer:

To: Enter Here WPB Industry Division or Company Requesting This Report:

Address (street, city, State):

Procurement item | Type | Model: | Number of procurement items covered:

Line No. | Material (See CMP Materials List) | CMP Code No. | Total Weight (Pounds) Net | Total Weight (Pounds) Gross Incl. Rejections, etc. | Lead Time (No. of Mos.)

which are normally attached to or shipped as a constituent part of the basic product, are considered a part of the complete assembly or procurement item, and are included in the bill of materials, whether Detail or Summary. Spare part sets contracted for at the same time as the basic product or procurement item, are also included in the bill of materials, but as a second grouping of materials, with a separate heading.

Unless specifically required, manufacturers do not list individually such small parts and minor subassemblies as standard bolts, nuts, washers, screws, and pins; electric lamp bulbs; pipe fittings; hooks, eyes, and findings; dry-cell batteries; small standard electric fuse plugs; small mechanical rubber parts, etc. Where these are Class B products, they are reported by Class B product groupings, and in terms of the units specified, on the official CMP Class B Product List and a reasonable approximation is acceptable. Where Detail Bills are required on Class B components, the approximate material content may be shown for such component groups as indicated above.

CMP Forms

Bills of materials are reported on special forms: CMP-1 (Summary Bill of Materials), CMP-2 (Detail Bill of Materials), and CMP-3 (Listing of Class B Products and GFE). It has been ruled that if another form is already in use, which is satisfactory to the customer or Claimant Agency, it is permissible to continue its use.

CMP-1. The Summary Bill of Materials shows only the materials included in the CMP Materials List, in the forms and shapes indicated, with the total net finished weight of each material included in the final product; the total gross weight including processing losses, rejections, etc., required for the manufacture of the product; and lead time, measured in months from the date of shipment of the CMP material from the supplier to the date of completion of the product or acceptance of the procurement item.

Each CMP-1 report must be accompanied by Form CMP-3, listing Class B components and incorporated GFE items. Class B items are reported in their most advanced state of assembly, and are classified as Group I or Group II. Quantities required are indicated in the units specified in the official CMP Class B Product List, showing gross quantities only, and lead time calculated as above.

When a Complete Summary Bill of Materials is requested, the material for each Class B component listed on CMP-3 shall be reported separately on CMP-1, so that the Complete Summary Bill of Materials will show the total CMP

(*Continued on page* 240)

OPERATING STOCKROOMS under GOVERNMENT REGULATIONS

How to determine ordering quantities and assure adequate stock levels for efficient operation while conforming to inventory limitation orders

By

R. H. WILSON

General Service Manager
Bell Telephone Laboratories

GOVERNMENT regulations for stock items are issued because the scarcity of materials makes it necessary to prevent an organization from overstocking and so causing a shortage in other organizations. It is therefore to be expected that as market conditions change the regulations will also change.

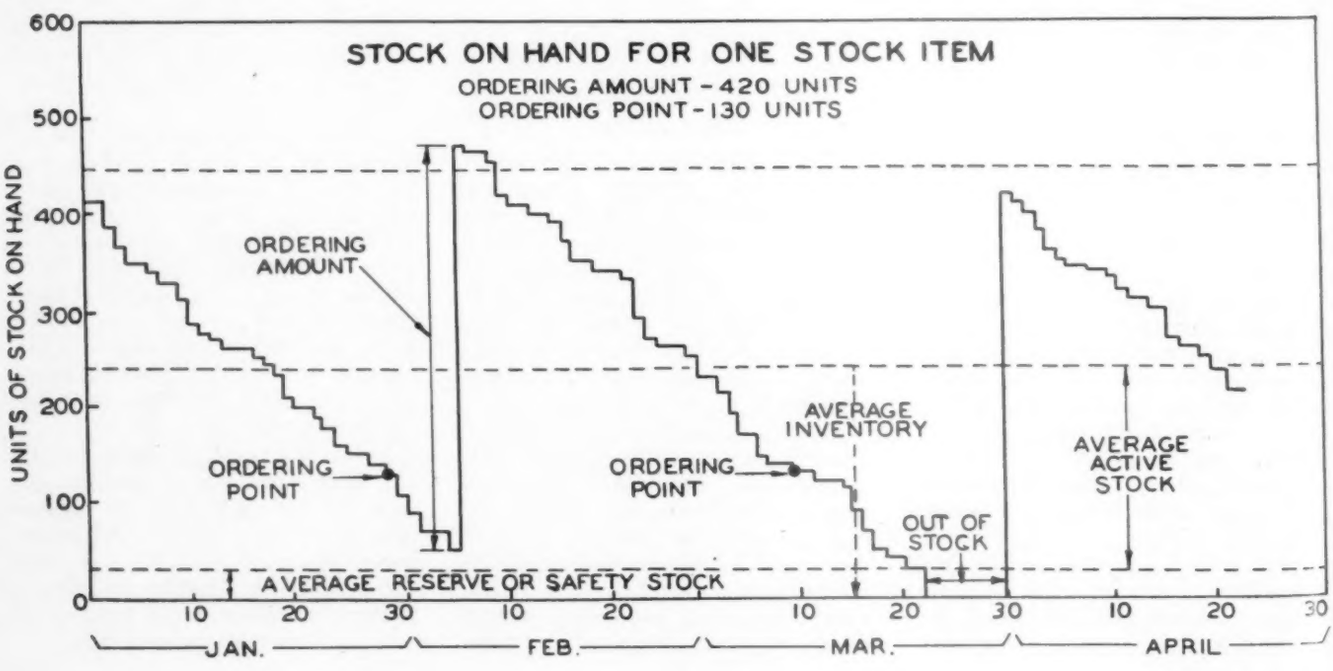
Government regulations occur in different forms. C.M.P. Regulation 2 as amended May 10, 1943 states under paragraph (b) "No user of controlled material shall after April 1, 1943 accept delivery of any item of controlled material if his inventory of such item is, or will be by virtue of such acceptance become, greater than the quantity of such item he will be required to use during the succeeding 60-day period for production, construction, operating supplies, or maintenance or repair, in order to carry out his authorized operations."

There are exceptions for those who use small amounts but otherwise the law is specific in limiting the supply on hand to 60 days consumption.

Another government regulation is the "Suppliers' Inventory Limitation Order L-63." This order as amended Feb. 10, 1943 states that certain supplies, which are given, shall have a "maximum permissible inventory" in the Eastern or Central War Time zones equal to two months' sales and in other zones equal to three months' sales. In an amendment dated June 10, 1943 these periods were raised to three months' and four months' respectively and the States specified in which this regulation has force.

It is seen from these two regulations that the government exercises control by limiting the amount of

EXHIBIT 1.



stock carried on the basis of consumption or inventory. The consumption regulation is used to control the maximum amount of stock carried for each stock item and generally applies to manufacturing organizations. The inventory regulation is used to control stocks carried for sale and applies to the total stock carried; there is, however, no way the stockroom can be sure of operating within an inventory regulation unless steps are taken to control each stock item. It follows from this that a method is required for ordering an amount of stock for each item which will result in the stock on hand being within the regulated amount.

Safety Stocks Needed

The complication which usually arises when trying to operate to a fixed value for either of these regulations is that the amount purchased is not the only factor which has to be considered. Stockrooms are operated in order to have a supply of material on hand when needed. Consequently some provision has to be made to prevent items from going out of stock. This is done by determining in advance the ordering point or minimum stock value. When the supply drops to this amount of stock then fresh stock is ordered. The ordering point is usually an amount of stock somewhat larger than the amount which will be withdrawn (on the average) while the fresh stock is on order. As a result there is generally an amount of stock on hand when the fresh stock arrives called the "safety stock" and this has to be taken into account under the regulation.

In order to have a clear understanding of the problem refer to Exhibit 1. This shows the stock on hand at any time for a period of a few months. It will be seen that in order to protect the item from going out of stock a fresh supply is ordered when the stock on hand has dropped to 130 units. Now it will be noticed that on Feb. 5 the stock on hand rose to 470 units although only 420 units were ordered. Also, referring to March 30, it is seen that the stock rises to an amount equal to the amount ordered only if the item has run out of stock which is an undesirable feature of stockroom service. From this it is clear that in order to operate within C.M.P. regulation 2 it will not, in general, be possible to order the 60 days' consumption amount if this is the maximum to which the stock on hand can rise. Some amount less must be ordered depending on the size of the average safety stock.

In controlling the inventory of a stockroom (which is the other form of control exercised by the Government) it is necessary to be sure that the inventory or average amount of stock on hand does not exceed the specified maximum. From Exhibit 1 it is seen that the average amount on hand is made up of the average active stock plus the safety stock; but the average active stock is one-half the ordering amount so the government limitation order L-63, as amended June 10, 1943, can be expressed as specifying that one-half the amount ordered plus the safety stock shall not exceed four months' sales in certain mentioned states or three months' sales in any other state.

Determining Order Amounts

These two examples of regulations are sufficient to show that in all cases of regulation which might

TABLE OF ORDERING POINTS AND SAFETY STOCKS
FOR CONTROLLING THE INVENTORY OR STOCK ON HAND
TO MEET GOVERNMENT REGULATIONS

THESE VALUES WILL RESULT IN LESS THAN ONCE OUT OF STOCK FOR EVERY 200 DEMANDS

AVERAGE NUMBER OF REQUISITIONS (CUSTOMERS) DURING NORMAL MAXIMUM RESTOCKING TIME	NUMBER OF AVERAGE CUSTOMER REQUISITIONS COVERED BY ORDERING POINT AND SAFETY STOCK		NUMBER OF DAYS' STOCK REQUIRED FOR SAFETY STOCK	
	ORDERING POINT*	AVERAGE SAFETY STOCK+		
.5	3.9	3.4	6.8	
1.	5.5	4.5	4.5	
2	7.8	5.8	2.9	
3	9.7	6.7	2.2	
4	11	7	1.8	
5	13	8	1.6	
6	15	9	1.5	
7	16	9	1.3	
8	18	10	1.2	
9	19	10	1.1	
10	21	11	1.1	MULTIPLY
12	24	12	1.0	EACH
14	27	13	.93	OF
16	30	14	.87	THESE
18	32	14	.80	FIGURES
20	35	15	.75	BY
30	48	18	.60	THE
40	61	21	.52	NUMBER
50	73	23	.46	OF
60	84	24	.40	DAYS
70	96	26	.37	IN
80	108	28	.35	THE
90	119	29	.32	RESTOCKING
100	131	31	.31	TIME
120	153	33	.28	TO
140	176	36	.26	GET
160	198	38	.24	THE
180	220	40	.22	REQUIRED
200	243	43	.21	NUMBER
300	353	53	.19	OF
400	463	63	.16	DAYS'
500	571	71	.14	STOCK
600	679	79	.13	NEEDED
700	787	87	.12	FOR
800	895	95	.12	SAFETY
900	1002	102	.11	STOCK
1000	1110	110	.11	
1100	1217	117	.11	
1200	1323	123	.10	
1300	1431	131	.10	
1400	1538	138	.10	
1500	1644	144	.10	

* THE FIGURES REPRESENT THE NUMBER OF AVERAGE REQUISITIONS OR DEMANDS WHICH CAN BE FILLED FROM THE ORDERING POINT STOCK. TO OBTAIN THE ORDERING POINT IN TERMS OF THE NUMBER OF UNITS OF THE ITEM MULTIPLY THE FIGURE GIVEN BY THE AVERAGE NUMBER OF UNITS DRAWN OUT PER REQUISITION.

\+ THE SAFETY STOCK IS THE AVERAGE AMOUNT OF STOCK ON THE SHELVES WHEN FRESH STOCK IS RECEIVED. THE FIGURES REPRESENT THE NUMBER OF AVERAGE REQUISITIONS WHICH COULD BE FILLED FROM THE SAFETY STOCK. IF IT IS DESIRED TO KNOW HOW MANY UNITS OF THE ITEM ARE IN THE SAFETY STOCK MULTIPLY THE FIGURE OBTAINED FROM THE TABLE BY THE AVERAGE NUMBER OF UNITS DRAWN OUT PER REQUISITION.

EXHIBIT 2.

arise, the problem of operation is to determine the ordering amount and the ordering point so that the combined effect of the amount ordered and the safety stock will keep within the inventory or consumption figure set by the regulation.

In certain instances the demand for a stock item can be predicted rather definitely in advance, due to manufacturing schedules, the manufacturing capacity of the plant, etc. When this occurs the ordering point can be made equal to the amount which will be drawn out during the restocking time. Naturally, this will leave nothing on the shelves when the fresh stock arrives so there is no safety stock, and the ordering amount can be equal to the consumption regulation or to twice the maximum inventory value.

This, however, is not the condition for the majority of stock items. Even when the demand is fairly steady it is necessary to use a certain amount of the stock on hand, as safety stock, and where a large number of customers ask for different amounts the amount of safety stock is usually an appreciable part of the stock on hand.

In order to see how the method works under this latter condition consider C.M.P. Regulation 2 which limits the supply of stock on hand to 60 days' consumption.

It has been stated already that the 60 days' consumption figure is made up of two parts. One part is the amount of stock ordered and the other is the safety stock. So if the number of days' supply in the safety stock is determined then the amount of stock to order is 60 days' supply less this amount.

In order to find the safety stock it is first necessary to determine the ordering point (or minimum stock value) which will protect the item from going out of stock.

A Scientific Method

This has been the subject matter of several articles by the author, one of which was published in the September, 1941, issue of "Purchasing". In this article a simple routine was given for setting ordering points with scientific accuracy, and it will be described below in so far as it is needed in connection with this problem. The whole question of reasonable protection against going out of stock is discussed in the article referred to and the reasons given for operating with limited but adequate protection for each stock item rather than trying to completely eliminate every out-of-stock condition. One other point applies in this case in addition to the fact that complete protection is very expensive and that is that it requires so high a value of safety stock that it cannot be generally used under this regulation. It must not be inferred from this that the stockroom service will suffer with the limited protection mentioned above. As a matter of fact the out-of-stock condition will be much better than that now obtained in nearly all stockrooms. It will result in less than once out of stock for every 200 demands made on the stockroom. This degree of protection is obtained by using Exhibit 2 to determine ordering points.

Using the Table

To use Exhibit 2 it is necessary to obtain the following information with regard to the stock item under consideration:

(a) The average number of requisitions (customers) in the restocking time

(b) The average number of units of the stock item in each requisition

If stock cards are kept the above information is readily obtained, otherwise a bin record will have to be maintained to obtain these figures.

In Exhibit 2 find the figure from (a) in the first column and along this line to the right in the next column is the number of demands which the ordering point should be able to fill to obtain the required protection. When this value is multiplied by the figure from (b) then the ordering point is obtained in its usual form as so many units of the stock item being considered.

In the last column along the same line as the ordering point is a figure which when multiplied by the number of days in the restocking time will give the average number of days' stock left on the shelves when fresh stock is received (safety stock).

Subtract this number of days from 60 and so obtain the number of days' stock to order.

(*Continued on page 218*)

ORDERING AMOUNT

COLUMN I	COLUMN II	COLUMN III
QUARTERLY DEMAND IN DOLLARS	ORDERING AMOUNT IN DOLLARS	NUMBER OF WKS. ORDERING AMT. WILL LAST
5	18	47
10	25	32
15	32	28
20	35	23
30	45	19
40	50	16
50	60	15
60	65	14
70	70	13
80	75	12
90	80	12
100	85	11
120	90	10
140	100	9
160	105	8.5
180	115	8
200	125	8
250	135	7
300	150	6.5
350	160	6
400	175	5.5
500	195	5
600	215	4.5
700	235	4.5
800	255	4
900	275	4
1000	290	3.8
2000	435	2.8
3000	550	2.4
4000	660	2.1
5000	760	2.0

EXHIBIT 3.

PROCEDURE CHART

for determining maximum permissible inventory

ROUTINE 1—*To maintain a "maximum permissible inventory" of three months (90 days' supply) for each item and for the stockroom. (Suppliers' Inventory Limitation Order L-63 as amended June 10, 1943 for certain states).*

When the demands for an item are made by a number of independent users and the item is liable to be called for in different amounts.

A. Calculate the average number of customers who will ask for the item during the normal maximum restocking time. This is the number of customers in the last quarter divided by 90 (because there are 90 days in the quarter) and multiplied by the number of days in the restocking time.

B. Find A in the first column of Exhibit 2 and along this line to the right find the figure in the next column. This is the ordering point value.

C. The ordering point value can be converted into units by multiplying by the average number of units in each demand. This is the ordering point.

D. Along the same line as in B but in the last column is the number of days' stock required for safety stock.

E. The amount to order is twice the figure obtained after subtracting the number of days' stock required for safety stock (see D) from the number of days' stock specified for the inventory. (Note 1).

F. If the ordering amount obtained from Exhibit 3 is less than E then order the amount from Exhibit 3. (Note 2).

In the event that the ordering point can be exactly estimated in advance so that there is no safety stock left on the shelves when the fresh stock arrives, then the amount to order can be as large as twice the specified inventory value.

EXAMPLE

Item—1-A Resistance 100 Ohms
Demand—54 in last quarter (customers)
Size of average order—773 units were drawn out on 54 demands, so average order $= \frac{773}{54} = 14.3$ units
Cost—$35.00 per 100
Restocking times—12, 13, 13, 15, 14, 28 and 11 days—so normal maximum restocking time is 15 days leaving out the 28 days which is not likely to recur.

Now follow the routine:

A. Average number of customers during normal maximum restocking time $\frac{54}{90} \times 15 = 9$

B. From Exhibit 2 along the line from 9 is 19 under the column for ordering point.

C. Ordering point is
$19 \times 14.3 = 272$ units

D. From Exhibit 2 along line from 9 in the last column is the number 1.1 to be multiplied by the restocking time of 15 days. This equals 17 days.

E. Amount to order is twice
$90 - 17$
or 146 days' stock. In 90 days the sales were 773 units so the amount to order is 1254 units or $440 worth approximately.

F. Since the quarterly demand is 773 units at $35 per 100 or $270 worth it is seen from Exhibit 3 that the most economical ordering amount is $141 worth. Since this is less than E it should be ordered.

ROUTINE 2—*To maintain a "maximum permissible inventory" of two months (60 days' supply) for each item and for the stockroom (Suppliers' Inventory Limitation Order L-63, as amended February, 1943).*

The routine is the same as Routine 1 except that 60 days' supply should be used as the maximum inventory instead of 90 days' supply.

ROUTINE 3—*To maintain a "maximum permissible inventory" of four months for each item and for the stockroom. (Suppliers' Inventory Limitation Order L-63 as amended June 1943 in the case of a supplier located in certain states as specified).*

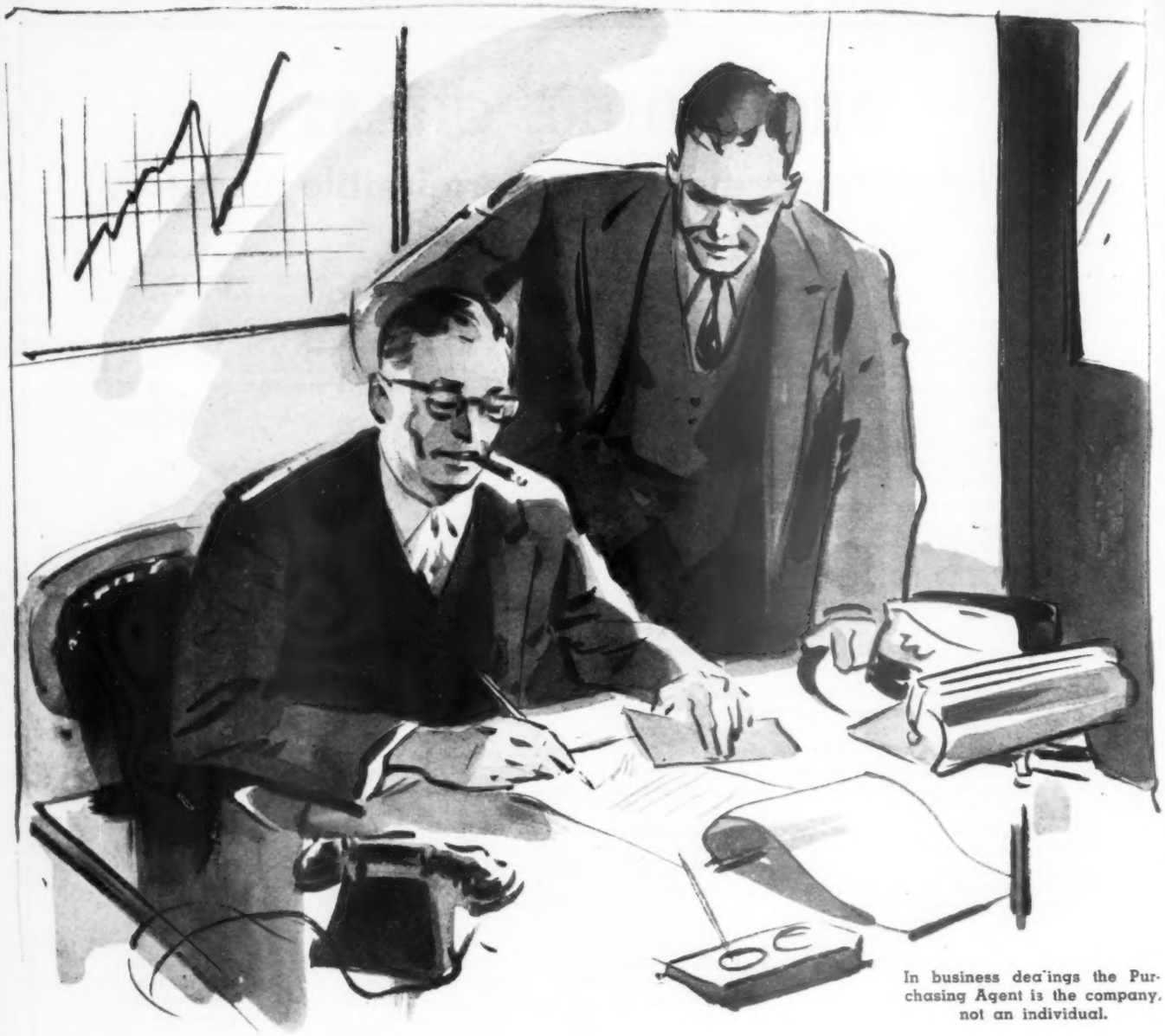
The routine is the same as Routine 1 except that 120 days' supply should be used as the maximum inventory instead of 90 days' supply.

ROUTINE 4—*Controlled Materials Plan Regulation 2—This limits the stock on hand for certain items to 60 days' consumption.*

The routine is the same as Routine 1 except that the amount to order (E) is obtained by subtracting the number of days' stock required for safety stock (D) from the number of days' stock specified for consumption instead of using twice this amount.

Other consumption regulations will also apply in the same way adapting the routine to the number of days' consumption specified.

Note 1. The reason for doubling the amount is that only one-half the amount ordered appears as inventory.
Note. 2. This will reduce operating costs and yet keep within the maximum set for the inventory.



In business dea'ings the Purchasing Agent is the company, not an individual.

LEGAL DUTIES of PURCHASING AGENTS

By

LEO T. PARKER

Attorney at Law

ALL representatives, including purchasing agents, are legally obligated to comply with certain well defined laws, rules and obligations. And all employers must assume definite obligations and responsibilities for acts of their agents and employes.

For example, an agent is expected by law to deal honestly and fairly with his employer; endeavor to earn no secret profits arising from the employment; and he must not, without permission of his employer, accept employment or compensation from persons with whom he transacts business for his employer.

On the other hand, an employer automatically assumes full responsibility for acts, contracts and promises made by a general agent and pertaining to the business or department in which he is employed. But the employer is liable only for authorized acts of his special agents.

A Purchasing Agent is a general agent who may be specifically authorized to purchase any or only certain kinds of merchandise. This means that the employer may be ob-

The relationship of the Purchasing Agent and his employer imposes definite obligations and limits to authority and action

ligated on all contracts, agreements and promises relating to purchase of merchandise used in his employer's business made by a Purchasing Agent who is given unusual authority. However, if the Purchasing Agent exceeds his authority and, for example, borrows money for use in operation of his employer's business, the employer is not liable but the Purchasing Agent is exclusively responsible for repayment of the money unless the employer consents to assume responsibility.

Obviously, many of these points of law are generally known by readers. Therefore, in view of imparting especially desirable legal information we shall review late and leading higher court cases which involve interesting and not exactly common place law, yet such law as may be encountered almost any day by Purchasing Agents.

Agent Earns Secret Profits

The rule which denies to an agent the right to purchase property of its employer which has been entrusted to him to sell to the best advantage, and thereafter to deal with it as his own, is firmly embedded in the law as an expression of public policy. The principle is said to be one of prevention, not remedial justice. It operates, however fair the transaction may have been, however free from every taint of moral wrong.

Moreover, modern higher courts hold that when an agent earns secret profits he automatically becomes a legal trustee of his employer and he is legally obligated to hold such profits in safe keeping for his employer.

Any principle justifying recovery, whether recovery of secret profit or otherwise, is based on the theory of liability created by public policy, which superadds to the contract a right of an equitable nature which cannot be considered strictly damages for the agent's breach or within his express or implied promise to pay. It is a right growing out of tract, rather than the contract itself, and the methods by which the amount of recovery is to be ascertained are not strictly those which apply to ordinary breaches of contract.

The principle on which a court elicits constructive trusts of this nature might be pursued with numerous other instances; as if a factor, agent or other person in fiduciary positions acquires any pecuniary advantage to himself through the medium of his fiduciary character, he is accountable as a constructive trustee for those profits to his employer or other person whose interest he was bound to advance.

For example, in Anderson, 20 S.E. (2d) 818, reported July, 1942, it was disclosed that an employer and a Purchasing Agent entered into a written contract by the terms of which the agent agreed to receive and sell all the cotton waste from the employer's mills. The waste was produced in the mills in large quantities, and was of various kinds, designated by technical or trade names. The agent was to receive as compensation an agreed percentage of the sales price—in some instances 5%, and others 6%.

The evidence further tends to show that over a number of years the agent himself became the actual purchaser and accounted to the employer on that basis, retaining upon the transaction the sales commissions fixed by the contract and retaining the profits upon the transaction, without making a full disclosure to the employer of the facts or that he had become the purchaser. In other words, the agent accepted delivery of the waste from the employer, resold it at a profit, not disclosed to the employer, and remitted the price agreed upon less the agent's commissions specified in the contract.

Upon discovery of these facts, the employer brought suit for the recovery of the profits alleged to have been realized by the agent, together with the commissions formerly paid to the agent as commissions upon his sales.

In holding the employer entitled to a recovery, the court said:

"Speaking generally, when an agent, in a fiduciary relation, is guilty of disloyalty to his principal and when by virtue of his position he seeks to make profit to himself rather than promote the interests of his principal, he is not entitled to compensation. In selling to itself, the defendant (agent) attempted to act in the double capacity of agent and purchaser—a combination so incompatible and noxious to the fundamental rule of loyalty demanded of an agent to his principal, acting as a fiduciary, as to be intolerable to public policy."

Therefore, it is a recognized principle of law that an agent who violates his legal duty may be regarded as trustee with respect to the property, profits and its proceeds. If he has transferred it to a bona fide purchaser, he may be made to account not only for its real value, but for any profit made by him on a resale.

Law of Consignment

In many instances purchasers take possession of goods on the "consignment" basis. Sometimes the purchaser immediately takes title to the goods and agrees to pay the purchase price when the goods are sold, or if not sold to return the merchandise to the seller. In other instances the seller retains legal title to the merchandise. It is important to know that if the seller retains title to the goods it is a bailment and not a sale, and the purchaser is not liable for loss, theft or damage to the goods if he exercises an ordinary degree of care to safeguard them. Otherwise, when the purchaser takes legal title to the goods, he is the owner and is fully responsible.

One of the principal tests by which to determine whether any particular contract creates a mere bailment or is a sale on credit is this: Was there a binding promise on the part of the purchaser to whom the possession was given to pay for the article? If there was such promise, then the contract is ordinarily held to be one of sale and *not* of bailment; and, conversely, if there was no such binding promise to purchase on terms agreed upon, then the transaction is ordinarily held not to be a sale.

Generally, contracts of this nature must be construed as a whole, and the intention of the parties is to be determined from the entire instrument, and not from detached portions. Individual clauses and particular words must be considered in

connection with the rest of the agreement, and all parts of the writing, and every word in it, will be given effect.

For illustration, in People v. Seymour, 128 Pac. (2d) 726, reported September, 1942, it was disclosed that the owner of valuable property placed it in the hands of an agent under an agreement that the latter should sell it and the profits would be divided between the owner and the agent. The contract contained a clause which provided that the goods were the sole property of the owner and that it was received by the agent for inspection only with the understanding that title was to remain with the owner.

In other words, this was a consignment agreement by which the agent agreed to take possession of the property, attempt to sell it, and the title to the property remained in the owner.

Could be Prosecuted

The purchaser sold the goods and could not account for the money. He refused to pay the seller. The important consideration of the court was: Is the transaction a bailment? If so the purchaser committed a theft and could be criminally prosecuted for keeping the money. However, if the transaction were a sale, then the purchaser simply owed the seller $14,000, the value of the property, and the seller's only recourse would be to file suit, as creditor against debtor, to collect this amount due.

It is interesting to observe that the lower court held the purchaser guilty of grand theft. The higher court upheld the verdict, and said:

"One of the most important rules in interpreting contracts is that the whole contract is to be taken together, so as to give effect to every part. Considering the present contract as a whole, the contention that it was a sale on a condition subsequent cannot be sustained."

Another important point of law is that in contracts of sale of merchandise with deferred payments, it is competent for the seller to prescribe his right to re-possess the property, on default of payments by the purchaser, when it can be done without a breach of the peace.

In other words, where goods are sold under a conditional contract of sale, and the seller reserves the right to repossess the goods on default by the purchaser, the contract is valid and enforceable.

For example, in Depositor v. Taylor, 162 S.W. (2d) 764, reported June, 1942, the higher court held:

"If the sales contract contained stipulations for re-possessing the property by the seller when default in deferred payment is made, such possession might be taken when it could peaceably be done, and the lien enforced by a sale of the property after due notice given to the purchaser of the time and place of the sale, whether privately or publicly made."

Therefore, if the goods cannot be peacefully re-possessed, as where the purchaser refuses to give up possession, the seller must file suit and obtain a court order to gain legal possession of the merchandise.

Elements of Fraud

Under ordinary circumstances an employer is strictly responsible for fraudulent acts of his agent. Sometimes responsibility for fraudulent acts and unauthorized acts is confused. An employer is not liable for acts performed by an agent who exceeds his authority or who acts outoutside the scope of his authority. But the law makes employers liable for all fraudulent acts performed by agents and relating to the employer's business.

For illustration, in Adams v. Higginbotham, 21 S.E. (2d) 616, reported August, 1942, the higher court stated important law, as follows:

"Fraud may not be presumed and while it may be proved by circumstances, it must nevertheless be proved."

Also, in Morrison v. Bank of Mount Hope, 20 S.E. (2d) 790, reported July, 1942, the higher court said:

"The rule is well established that one to whom a representation has been made may believe the same to be true and act thereon without making inquiry or investigation to determine the truth thereof."

It is important to know that an exception to this law has been recognized by some courts where there were facts and circumstances present when the false represenations were made *so as to put the injured party upon his guard* or to cast suspicion upon their truthfulness. See, Pustelniak v. Vilimas, 352 Ill. 270; Morel v. Masalski, 164 N.E. 205; and Parker v. Ward, 224 Ala. 80.

Constructive fraud is a term applied to a great variety of transactions which the law regards as wrongful and to which it attaches the same or similar effects as those that follow actual fraud. Also, the term has been evolved to designate what is essentially nothing more than the receipt and retention of unmerited benefits.

Constructive trusts arise by operation of law to prevent injustice; fraud, active or constructive, is their essential element, and they will arise whenever it becomes necessary to prevent a failure of justice.

Moreover, the court will "construct" a trust where a person gains something he should not be permitted to hold in good conscience through actual fraud, abuse of confidence, or questionable means. A constructive trust arises not from agreement but from operation of equities in order to satisfy demands of justice. A court in decreeing a constructive trust is bound by no yielding formula as the equity of the transaction must shape the measure of relief. A constructive trust is imposed not because of the intention of the parties but because the person holding the title to the property would profit by a wrong or would be unjustly enriched if he were permitted to keep the property.

Disclosing Facts

For illustration, in Olitkowski v. St. Casimir, 4 N.W. (2d) 664, reported August, 1942, it was disclosed that an agent was employed to perform specific services. The legal question arose whether the agent was legally compelled to disclose all facts pertaining to offers and acceptance of employment, salary, and commissions from another person while being paid by this employer to transact business. This court said:

"Where an agent is invested with authority or discretion, it is against public policy for him to represent the other party in the transaction without full disclosure to both of his dual agency."

With respect to the right of a lower court to declare that the acts of the agent involved a constructive trust, the higher court said:

"Constructive trusts are such as are raised by equity in respect of property which has been acquired by fraud, or where, though acquired without fraud, it is against law that it should be retained by him who holds it."

Also, with respect to responsibility of an employer for fraudulent acts of his agent, see Upell v. Bergman, 246 Mich. 82, in which the higher court explained that an employer always will be held liable for the fraudulent acts of his em-

(*Continued on page 228*)

STRAW HATS IN WINTER!

Don't try to monkey with the law of supply and demand, for it's a more potent statute than any regulation that the politicians and bureaucrats have devised

By
CHARLES FORD

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OLD Hutch, the one-time famous wheat speculator in Chicago, used to say: "Buy your straw hats in winter, and your overcoats in summer."

The immutable law of supply and demand has a handle at each end. You can grab one end or the other. You can't lay hold of both; neither can you play both ends of it against the middle. We shout "produce more goods," and then try to scheme around and hornswoggle the public into paying higher prices. Like King Canute, we try to order back the irresistible flow of the tide. If too much water runs over Boulder Dam, we try to stem it with a bath sponge. With the populace asleep in the midst of plenty, strongly organized minorities work overtime on schemes for creating artificial price levels on farm products, on silver, on labor. One gang thrusts jack-screws under the food market, another seeks to push props under wages. They seesaw back and forth trying to push their prices up and keep the other fellow's down, they try all sorts of tricks to make a monkey out of old Uncle John J. Supplyanddemand; but one day when they think they have the old rascal hogtied, he yawns, stretches, and the jack-screws and props and little bits of twine scatter all over the landscape, and stuff again sells for what it is worth. We forget that reaction is equal to action, and opposite in direction, and keep on hoisting ourselves over the barbed wire by our boot-straps,—that is, we think we're doing it.

Problems of Surplus

We seem never to learn the wisdom of letting nature take its course. But in spite of our efforts, nature, sooner or later, will do it anyhow, and our efforts look foolish. Once upon a time, when we had a big crop of grain, it was a season of rejoicing. Peoples overseas were mighty glad to take it off our hands, with cash on the barrel-head. We cleaned up for cash and got a good start on the next year with money in the bank, a new red self-binder in the shed, and a carload of fertilizer ready when we needed it. But other countries found they could raise grain and cotton and sell them, and we found ourselves with uncomfortable carry-overs.

Then our underdone economists figured out the idea of starting a colossal hock-shop with Uncle Sam's capital. It was lots easier than getting out and scratching to sell our surplus, or to think out new ways of turning into cash the load the slippery foreigners left on our hands. So, we persuaded Uncle Sam to lend money up to pretty near its value on the stored surplus, ignoring what every Purchasing Agent knows, that a stored surplus is a forgotten surplus, and nobody bothers about it. What the hell anyway? The government has unlimited money. Nobody thinks of the fact that if something happens to release that stored surplus, or if another Congress decides Uncle Sam has been the goat long enough, the price of that stored grain or cotton, always a sword of Damocles over the market, will slide down until it catches fire. If a dam busts, somebody is going to get flooded out.

Regulating Human Nature

Years ago we tried an experiment, noble in purpose, of telling the public all and sundry, there wasn't going to be no more rum. The cup that cheers and also inebriates, was banned. "Drinkin' licker" was a thing of the past, and our young people would grow up unsullied by the taint of the demon rum.

We all know how that came out. In practice now, we can have all the hootch we want; but we are bootlegging tires and gasoline and meat and anything else with a government fence around it. The sum and substance is that we, as a people, don't like to be forbidden things. When anybody tries it, we say "to hell with 'em" and work twice as hard to get the things from which

we are barred. This isn't law-abiding, and it isn't nice, but it's the nature of the beast. And you can't go against human nature any more than you can nullify the law of supply and demand.

The big stores have a wholesome practice, when the season for garments is over, of marking down what they may have left and turning it into cash to make way for the new season's stuff. They have sold all they can at their normal mark-up; if they can get cost out of the left-overs and keep the money working, it's good business to do it. I think it would be better business, with a surplus of grains and cotton and meats and such things, to get busy and sell out. Get the money out of the stuff and set it again to work. If you can't find buyers for the produce "as is", dig around for some new uses for it. With a huge stored surplus of grain, we pretty nearly had to drink our morning coffee bitter because some folks thought they had to take all our sugar for war alcohol, until somebody with a practical mind reminded us we could make alcohol just as well from hocked grain as from unhocked sugar.

The Farmer's Plight

What of the poor farmer? I say the poor farmer is better off with his grain marketed, even at a lower price, than stored in a government pawn shop. He knows where he stands, and he hasn't the menace of a market floor, held back only by a dam of more or less doubtful strength. We have a war on, and even the credit of our government can't withstand too much strain. Conditions can crowd down a farmer to a certain extent, but if he uses his noodle he's safe enough.

You can't starve him out. If he takes advantage of his possibilities he is sure of plenty of grub twelve months of the year. He can raise garden sass, he can put down spuds and turnips and cabbages and squash; he can keep his fruit trees in good shape so that his pie possibilities are almost infinite; he can have hens for laying and roosters for the pot; he can keep a few pigs and make his own hams and bacon and sausages; he can keep a couple of cows and a few turkeys and maybe some ducks and geese; and, by heck! he will eat regularly and needn't worry about second helpings. His women folks can can and preserve enough stuff to stock a grocery store. All he needs is some cash money for his tobacco and sugar and coffee and hickory shirts, and maybe a jug of rum.

And he gets the cash money by selling his staple cash crops—wheat, corn, oats, hay, cotton, beans, tobacco—anything he can raise on his particular spot of land. No, I think the farmer, if he uses his bean and attends to business, is in the strongest position of anybody. True, he's got to work; but most of us spend all our time between meals working at something to bring in more or less honest dollars. And I know a good many city fellers who are grooming some farms to support them when the bust comes. Don't waste any sympathy on the farmers; that's the politicians job.

Half-Way Measures

I say, let supply and demand put prices where they will, so you leave prices to supply and demand. I'm no long-haired economist, but I'll bet you ten plugged nickels against a smooth cent that if we had taken either extreme—let nature take its course as to prices, or say: "Boys, there's a war on. Until it's off, prices of everything you make or raise or buy or sell, and every pay envelope and salary check stay right where they are"—it would amount to the same thing in the long run. The trouble is in this half-way business. We make haddock of one thing, herring of another, and ham of a third, and hash of all of them. When blind leads blind, somebody's going to take a header down the coal-hole.

Nowadays, the Purchasing Agent has to consider not only his commodities—how much on hand and how many customers—but in the midst of plenty he has to run the gauntlet of a lot of red tape and regulations, with threats of being hung and sentenced to three hundred years in jail to boot. The needs of his business send him out hunting for whales, and he is liable to return with a lone minnow and a lot of seaweed.

During the last war, prices went up like a Flying Fortress, but if you were persistent and polite, and could produce evidence of solvency, you could get goods. You probably had to pay heavily for them, but you got goods. Now you're not so much worried about the price as about the possibility of getting even a whiff of the stuff you need.

I don't think this is any time to worry about profits. Even if you do make a little money, the tax collector will get it away from you. What's the odds? You work like the devil and earn a modest income and spend it according to the standard of living you have set up for yourself; if you get a large income and maintain the same living standard, you haven't any more in the sock at the end of the year,—the tax collector takes care of that.

Who Pays?

Whenever you begin to carry stuff over beyond its legitimate season, it begins to owe you money. Interest, storage and insurance work nights and Sundays, and you most generally can't add their accruals to your selling prices, be you individual, state, or government.

There seems to be a popular idea that when the government pays, it doesn't cost the people anything. Where does the government get its money? Taxes. Who pays the taxes? The people. Then who foots the bill for all these carrying charges on stuff withheld from the market? Just you and I, brother, and there ain't no two ways about it. Take this hooey about subsidies to reduce the people's living costs; what are these subsidies? Just money paid to somebody to enable him to get by. Where does the money come from? Government. Where does the government get it? Taxes. Who pays the taxes? Again, brother, you and I are the elect, and we are supposed to benefit by the subsidies. Ain't it wonderful?

In earlier days in Manhattan, Pat Rafferty had made a fortune in the contracting business and was elected to the Board of Aldermen. Prior to taking his seat, he toured Europe. He got quite a reception when he appeared at a meeting of the board, and made a speech. His peroration was something like this:

"And Venice, gintlemen, ah, that's the beautiful city. Why, all the streets is paved wid wather. And thim gondolas floatin' around is the foinest things I iver seen. We ought to have some here, so I move you, Mr. President, that a committee be appointed to purchase twinty gondolas and put thim in the lake in Central Park."

Mike Reardon, a fellow alderman followed: "Mr. President, I think Pat Rafferty has said a mouthful. But wouldn't it be well to timper this wisdom wid a little economy? I think we should instruct the committee to purchase two gondolas, male and female, and let nature take its course."

And if you are holding over any straw hats, better sell them at winter prices and make room for the new crop.

SETTING UP A NEW PLANT

Factory "Know How" and all-round resourcefulness are the basis of successful equipment purchasing

By

GEORGE E. HENRY

THE key men of industry upon whose shoulders rest the responsibilities of procuring plant equipment, production materials and MRO supplies are of necessity a resourceful, capable lot. This brief story is about one who among other things bought a factory, moved the equipment, and developed a new manufacturing plant whose equipment investment alone was more than $200,000.

He planned the new factory from office front to shipping room, specified the equipment needed, laid out the production line, and also purchased the equipment for an electronics division making secret equipment for the government, though he is not permitted to pass through its portals except when urgency demands and then only with a military pass.

In the realm of industry, Standard Aircraft Products, Inc. is not one of the colossi of the North. It is, however, a very substantial industrial organization enjoying enviable prestige in its field. And the activities of Vice President and Director of Procurement E. A. Lotti are of unusual interest because of their wide scope and the indicated versatility of the man behind them.

It is one of the nation's 175,000 manufacturing plants, major and minor, in which procurement now is one of the major headaches. Though war conditions have materially enhanced the prestige of the Purchasing Agent and have further demonstrated the essentiality of centralized procurement, there are those whose conception of industrial procurement is that it is a mere procedure of placing orders; also, there are many newcomers in the field of purchasing who feel that a knowledge of WPB rules and regulations is "procurement", and who are wondering what the post-war period holds in store for them. Accordingly, the diversified activities of E. A. Lotti may enlighten matter-of-fact management, and point a way for the novice in purchasing to make a place for himself in this key industrial profession—and right here it is pertinent to emphasize that a majority of the successful men in purchasing have a technical background.

Standard Aircraft Products, Inc. has two factories, one in Dayton, Ohio, and the new one which is in the heart of New York City. In these it gives employment to some 1,000 persons who are producing equipment and accessories for the nation's biggest wartime industry—the aircraft industry and its mighty weapons—the Flying Fortresses, British Mosquito, Curtis Helldiver,

HERBERT J. SWANN
Vice President and Controller

E. A. LOTTI
Vice President and Director of Procurement

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During a period when machine tools were No. 1 on the "hard to get" list, Mr. Lotti succeeded in completely equipping Standard's new plant with standard and special machinery, and getting it into production on war work.

Bell Airacobra, the P-38, and other well known types of warplanes.

These products range from hardware and lighting equipment for aircraft, to specialties for liquid cooled engines, and secret electronic devices. The company is operated as four divisions, namely: the Sterling Aircraft Products Division, the Aircraft Lighting Division, Standard Temperature Controls Division (at Dayton), and the Standard Electronics Division. The Controls Division specializes in instruments for liquid cooled airplane engines, the Products Division makes aircraft parts and hardware, and the Electronics Division is working on intricate instruments for the army signal corps.

Mr. Lotti is directly responsible not only for operation and production in the New York plant, but for the procurement of materials for its three divisions—Lighting, Aircraft Products and Electronics. This factory occupies some 50,000 square feet of floor area in one of Father Knickerbocker's busiest industrial areas. This is the plant that Mr. Lotti designed and equipped. In connection therewith he spent considerable time in Bridgeport, Conn., analyzing and inspecting the equipment in the plant of the Stratford Manufacturing Co. to determine whether it would meet his requirements. Standard Aircraft Products bought the entire plant and its equipment was moved to New York 100%.

There is some $80,000 worth of machine tools and other equipment in the New York plant's machine shop. Here are turret lathes of the universal type that can do chucking as well as handle bar stock from 1" up to and including 3½"; four-spindle automatic screw machines having a range of from ⅜" to 2¼" for Class 3 threads, precision bench lathes, hand screw machines, grinding and polishing equipment, and complete equipment for a modern tool room. The laboratory represents almost an equal investment in standard and specially designed technical equipment.

For the lighting system, Mr. Lotti elected to use trough type fluorescent daylight lamps throughout the plant. He states that the artificial "daylight" is the best light for handling small parts and for doing precision work. The lighting system represents an investment of $30,000, and to complement the effectiveness of the "daylight" lighting, Mr. Lotti specified that interior walls and ceiling be finished in Menlo Park green. This is a green shade that is easy on the eyes and makes for comfortable eye conditions for though it has excellent light reflecting qualities it is minus glare or irritating intensities.

The question naturally arises as to Mr. Lotti's background and experience that enabled him to plan and complete a project of this sort. He modestly states that he has had considerable experience as an all-around handy man in the machine shop of the Condenser Service Engineering Co., Hoboken, N. J., where he started his work-a-day career. Being of a mechanical bent he made an intimate study of machine tools and other factory equipment, becoming quite familiar with their physical characteristics, maintenance and operating features. If necessary, he could today dismantle

a complex machine tool and reassemble it. Here he also commenced what he claims will be a life-long study of steels and alloys and the non-ferrous metals and alloys. In today's critical materials emergency he can immediately indicate what NE steel is a practical substitute for a given S.A.E. specification, or indicate the proper substitute from a physical and chemical analysis of the thing that is to be produced. If the Army Air Corps specifies SAE 2330 steel, he knows from study and practical application that NE 4037 or NE 8630 is an acceptable substitute.

But to go on. Following his connection with the engineering company, Mr. Lotti became General Purchasing Agent for the Champlain Corporation in Garfield, N. J., a division of the International Chemical Corporation. Later he became Purchasing Agent in charge of manufacturing and subcontracting for Air Associates at Bendix, N. J. He purchased all of the equipment for the huge Bendix plant, calling for an expenditure of approximately half a million dollars.

Practical Experience

Conversely, Mr. Lotti earned his spurs through the old formula of natural bent, study and experience. These provided him with the "know how" that has enabled him to plan a factory, and select and acquire the equipment therefor. He emphasizes that successful procurement is based upon intelligent collaboration with operating and production officers and that this is best achieved by having a thorough understanding of plant production and the equipment, materials and supplies needed therefor. He will also tell you that of the three factors entering into purchase, quality ranks first in importance. "It has been my experience", he said, "that it does not pay to sacrifice quality for price consideration in the buying of materials, equipment or supplies. The Purchasing Agent who knows the requirements of his plant, and who knows equipment and materials values and dependable sources of supply does little worrying about the factors of price and service.

"For example," he continued, "I feel that the established makers of machine tools and other manufacturing equipment, office machines, and the multitude of accessories that are a part of the manufacturing procedure, as a rule all offer quality products.

"However, conditions born of the war have created many acute problems. The purchase of new equipment, for instance, is largely governed by the availability of equipment, the work to be performed and the amount of tooling involved. If a $3500 machine requires eight weeks delivery and a comparable machine can be purchased for the same amount of money on three weeks delivery there obviously is but one choice in today's emergency regardless of specific preferences.

"Sometimes there are improvements here and there that may influence a purchase, but on the whole we purchasing agents have a comparatively wide range from which to make selection. If we are not satisfied with service performance of some companies or distributors, and if we know what we want and what it is for we cannot as a rule get far off the beam in exercising our authority to purchase other than a plant man's recommendation.

"It is my experience that the technical men that we must work with are pretty level headed fellows. They too are familiar with the high standards maintained by the makers of competitive equipment and are not averse to changes from their recommendations when there are good reasons.

"We also understand that makers of competitive equipment as a rule turn out tools that will do a good job, and we are familiar with the idiosyncracies of the journeymen who operate such machines. An expert on one machine may condemn a machine that another mechanic swears by, possibly for some minor reason such as the location of a handle or a knob or a switch. My experience with lathes for instance, is that a good mechanic can do an equally good job on any one of the several makes, though he may feel that a certain one is "tops". And, there may be special precision equipment, raw materials, alloys and so on which have a limited source, in

(*Continued on page 238*)

BETTER EDGES — LONGER LIFE

Hand stoning of cutting tools after grinding shows remarkable improvement in results

EVERY time the edge of a cutting tool becomes dull, there is a reduction of speed and quality of its performance, time is lost while the tool is reground to renew its effectiveness, and metal is wasted in the process of regrinding. The microscope shows the reason why cutting edges become dull and points the way toward improving that condition.

The ideal cutting edge is an unbroken line at the junction of two planes, usually forming an acute angle. But after ordinary grinding, this line is far from unbroken. The planes are microscopically grooved from the action of the abrasive wheel, and the edge is consequently an irregular succession of tiny peaks and valleys. When the tool is put back into service, the individual peaks or projections bear the heaviest load. That in itself represents a loss of cutting efficiency, but the results are actually more serious. For the peaks break off under strain, passing the load along to smaller peaks, and leaving—not an edge, but flat spots that rub instead of cut, and generate heat. Presently the entire edge is affected and another regrinding is in order. Meanwhile the hardness of the cutter itself may have been impaired.

Further refined grinding by a finer grit wheel, after the ordinary regrinding, naturally produces a better edge, but it is not the complete answer. Many users have found that a light hand stoning with a good oilstone immediately after grinding, effectively removes these microscopic irregularities and results in faster and better cuts and longer cutting life. A few more light touches with the oilstone at the first sign of dulling will again restore the edge and avoid the time and waste metal of regrinding up to the point when the original bevel or best cutting angle has been lost.

Oilstones (aluminum oxide) are available in a wide variety of shapes, and in a range of fineness to suit all conditions, for use on milling cutters, lathe bits, drills, and other edge tools. Reported results of such hand stoning include one instance in which production of 67 parts before regular regrinding was stepped up to 280 parts; another in which hand stoning increased the production of an 18-4-1 steel tool by 700%! The savings in set-up and grinding time, and in the conservation of precious tool steel, as well as greater production speed and better finished on machined parts, combine to make this simple hand stoning operation highly desirable.

COMPANY ORGANIZATION for PRIORITIES HANDLING

Priorities information and procedure affects virtually all departments of the company, but it is primarily a purchasing responsibility

By
LANG ELLIOTT

WITH the change from the buyer's market of the thirties to the present war economy, impacts felt by industry have been many, varied and heavy. Not the least of these has been the evolution of the purchasing and procurement function from a matter of selection of sources to a problem of finding sources and obtaining government approval of the purchase. This sudden change has necessitated expansion of the procurement function to include handling of priorities and allocations matters, and either the expansion of the purchasing department or the establishment of an entirely new department for the purpose of dealing with the priorities problem.

This growth has, in most cases, been gradual. Increased detail work necessitated the addition of a man here, a stenographer there. Further work to be done took more and more time, both executive and clerical. Gradually, and under pressure of circumstances, companies have expanded and changed their organizations in order to handle the vastly increased amount of work thrown, initially at least and permanently in most cases, on the purchasing department.

There are many sides to the job of dealing with priorities and allocations. It is not solely a purchasing function. There is, as a matter of fact, considerable basis for the contention that it is not at all a purchasing function, but an entirely different and separate one from that of purchasing.

Securing information is the first task of the organization which must deal with priorities and allocations. Sources for such information are many and varied; it is vital that adequate information be secured, and therefore it is important that full use be made of all sources available.

Much of the information must

of course, come from within the company—from the sales department, as to who wants to buy what, for what purpose, when, and what preference rating the prospective buyer can secure; from the stores and materials control department, as to stocks on hand; from the purchasing department, as to what priority rating must be secured in order to get delivery; from the production department, as to when delivery of materials must be secured in order to meet production schedules.

Outside sources must be tapped, too. The basic priority regulations must be familiar to the organization, and it must keep up with current and prospective changes. *The Federal Register,* the official bulletin for all Federal regulations; *Victory* (formerly *Defense*), the official bulletin of the Office for Emergency Management; weekly loose-leaf reference services of various publishers; trade publications; and daily newspapers will all be valuable sources of information as to regulations passed, and factors which may lead to changes in the future. PURCHASING and the *Bulletin* of the N.A.P.A., among others, also carry summaries of government actions taken.

Interpretation of this information, once it is secured, is, of course, necessary. Legal aid will sometimes be needed, and it will frequently be necessary to secure interpretations from the nearest agency of the Office of Emergency Management.

On the basis of this information, the organization which handles the matter must be prepared to furnish information where it is necessary—to the company's various departments—sales, when a customer wants to know whether he can secure a rating for a given purchase; purchasing, when it is necessary to determine the priority standing of a pending order for material; production, when information on speed of delivery possible is desired—or to the many and varied agencies of the government.

Special Records

And the government agencies ask for plenty of information. Statements must be rendered showing consumption of various critical materials, inventories on hand, and a variety of information on other matters, either through regular prescribed reports or all-too-frequent information requested from time to time by these various agencies.

In order to be able to furnish this information and to substantiate the claims made in its presentation, the organization must keep records. Sales order priority documents must be kept for two years or longer, for example. Further records must be kept for the information of the company on governmental actions or enactments, and information on pending orders and ratings must be filed conveniently.

Someone, too, must do the work of issuing preference rating certificates, blanket, project, or individual order, and of maintaining control over the materials so secured to be sure they are used on the orders specified rather than on orders of lower priority ratings, if penalties in the form of fines, imprisonment, or suspension are to be avoided.

Furthermore, many other jobs of planning and estimating fall to the priorities handling organization. Decisions must be made frequently by this organization, on the basis of its familiarity with the various operating rules and plans—priorities regulations, the production requirements plan, limitation orders, and so forth.

On top of all this, the organization must stay wide-awake and thinking, in order to foresee changes in the priorities and allocations set-up, and prepare to meet such changes.

Impact on Other Departments

Clearly the task involves not alone a purchasing function. Every department of the business is closely and intimately tied up with it; its impact is universal.

In addition to furnishing information as mentioned above, for example, the sales department will require information and aid. Customers will want information, and the sales department will have to know something of what it can sell, to whom, and for what purposes. It will also be intimately interested in possible delivery dates, a question which is closely tied in with the priority which can be secured for the order in question. Further, it may find that it has not enough sales work to do to keep it busy, and this may lead to the use of much of the sales personnel in other jobs—expediting, perhaps, or priorities work.

TYPICAL ACTIVITIES OF THE PRIORITIES SECTION

Up-to-date information on regulations governing the company's operations

Contacts with governmental agencies

Coordinating priorities procedure with planning, procurement and production routines

Special records of priority documents

Issuing preference rating certificates

Inventory limitations and records

Proper disbursement of priorities materials

Preparation of bills of materials

Reports to government

Working with customers on priorities requirements

Working with suppliers and subcontractors on priorities requirements

Anticipating changes in government policy and procedures regarding materials

Decisions based on limiting orders

The need for information and aid on the part of the production departments is evident. Scheduling of orders must depend on their priority ratings, and on the ratings of orders yet to be secured. The speed with which various materials can be secured for different purposes has immensely important connections with the problem of development of substitutes or the utilization of alternate materials. Priorities ratings which can be secured are important, too, in obtaining and dealing with subcontractors, which may be the concern of both the production and purchasing departments.

Stores handling depends, too, on information from the priorities organization. It is, as indicated above, absolutely essential that materials be used for the purpose for which bought, if they were secured with a preference rating. Control over the issue of materials, then, depends to a large extent on information as regards priorities. The stores department, too, is interested vitally in the regulations governing the size of inventories, whether of critical or other materials, and, as indicated above, it is the primary source of information regarding the size of inventories on hand.

Other branches of the business are affected in various ways. The legal department must be ready to furnish aid in interpretation of regulations; the engineering department is vitally affected by scarcity of materials when it considers new designs or development of substitute designs or products; expediting activity must depend on priorities information.

Purchasing Responsibilities

The duties to be performed in connection with priorities, then, are involved closely with every activity of the business—sales, production, stores, and so forth, as well as with purchasing. Yet the fact is evident that, although a separate function, the handling of priorities is more closely tied to the purchasing function than to any other. It is a source of information to be used in tempering and modifying operations of most of the functions of the company; it is a necessary tool without which purchasing cannot operate, and with which it must deal constantly. The effect of material shortages is felt first in the purchasing department; the need for priority ratings becomes evident first to the purchasing department, and only secondarily to the other departments of a business. And the purchasing department, in many ways, is peculiarly well adapted to deal with priorities.

First, as regards dealing with outsiders, it is the purchasing department which now has the difficult job. Selling, in most cases, is today merely a matter of taking orders for the available goods, and maintaining good will of disappointed customers. It is the Purchasing Agent who must go after supplies aggressively, and aggressiveness is of little use without priority ratings to back it up. Dealings with suppliers rely in most instances on priorities ratings. It is the job of the purchasing department logically and inevitably, to find out what preference rating is needed to secure material at the proper time, because such information can come best from the company's suppliers.

The close tie of the priorities function to purchasing then, is clearly justified. It is the purchasing department which *must have* the ratings secured; it is to the interest of the customer to furnish the best rating possible, and aggressive effort is therefore not often necessary on the part of the sales department. It is the lot of the purchasing department to exert the pressure. Because of this fact, that the purchasing department rather than the sales department must be best equipped to fight today's battles, it is logical that priorities handling should be closely connected to the purchasing function.

If the situation is one in which it is imperative for the company to secure sales, for which sales it is necessary to secure priority ratings from customers, it might be then that the closest ties of the priorities handling body should be with the sales department in order to facilitate customer relations. But such is not typically the case today. Supplier relations are most urgent and pressing, and therefore priorities control is most closely connected to purchasing.

With these facts in mind, alternative organizations and organizational problems in handling priorities and allocations may now be considered.

Forms of Organization

The first and most obvious way of company organization for priorities control is to place the entire responsibility for the function on the purchasing department. As has been noted, this organization is prevalent, and is a logical outgrowth of the fact that the first pinch of material shortages is felt by the Purchasing Agent.

This form of organization makes for ready availability of information to the purchasing department. Conversely, it creates a situation in which the purchasing department must serve as an information center for the entire organization. This may be or may not be desirable. Much depends on the extent to which the organization under the Purchasing Agent is allowed to expand, the extent to which it is realized by the Purchasing Agent that, while under his control, the department is performing an entirely distinct function from that of purchasing; and the degree of co-operation which is obtained from the other departments of the organization in furnishing information and using information furnished them in the conduct of operations.

Interdepartmental Problems

Personalities must be considered when a function such as priorities handling is placed in an organization. Constant contact with the organization will be had by men from other departments. This contact, furthermore, will not at all times result in pleasant consequences for all. The sales department may be forced to reject orders which, in the interest of customer relations, it would like to accept; this is a more and more frequent occurrence as civilian production gives way to war production. It should be pointed out here that the Purchasing Agent may be able to aid the war effort by properly directing the efforts of his company in selling its goods—that is, in getting contracts for war work.

The production department also may find it is forced to alter and upset its schedules because of shortages, and again here there is danger of conflict between this department and the priorities handling body. Regardless, then, of the impossibility of securing materials enough to alleviate these difficulties, criticism, unjustified though it may be, will occasionally be leveled at the body handling priorities control. One disadvantage, then, of having this function under the control of the Purchasing Agent, is that if there is any tendency for conflicts to arise between purchasing and sales, or purchasing and production, the conflict may be augmented because of the lack of realization on the part of those not thoroughly familiar with the materials control set-up that there are not enough goods for everybody, and that some orders must be rejected and some production schedules disrupted.

The immense amount of time,

executive as well as clerical, which will be utilized in the performance of the many duties connected with priorities and allocations, is a further handicap to the system of having the matter under the direction of the Purchasing Agent, unless the top management is fully cognizant of the fact that additional help, and, more important, additional high-class help, is needed. There is an immense amount of detail work, of course—filling out preference rating certificates, inventory reports, consumption reports, making out orders requiring a mass of detail and involving multiple signatures, filing sales order priority documents, filing reports of legislation and government action, and so forth. That in itself is no real bar to placement of the priorities organization under the purchasing department. Additional clerks can be added and additional space secured with no particular difficulty, or at any rate with no more difficulty than would be experienced in securing more such aid for a new department. The real bottleneck is in executive time.

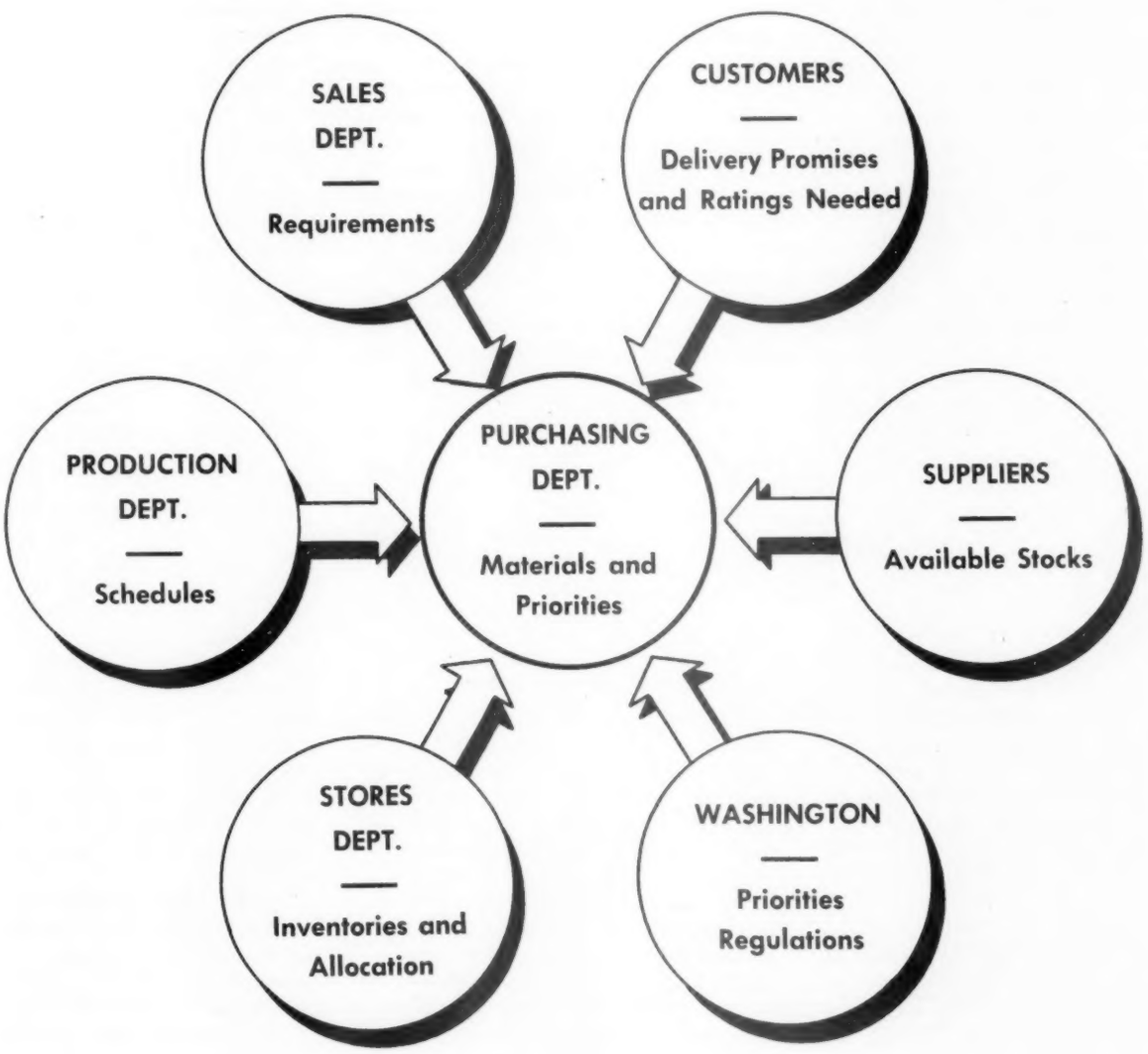
Of all the company executives, the Purchasing Agent probably has the least spare time during the present emergency. Materials are hard to get. Contacts must be made with suppliers, and aggressive effort expended to secure needed materials. Close contact with the production divisions must be maintained in order to determine what is needed and when. Volume of orders placed has increased, and governmental red-tape has increased vastly the detail work to be handled. From the point of view of executive time available, then, the purchasing department is not likely to be a good place to locate the priorities handling organization.

Executive Time Needed

And the priorities job requires executive time. Many matters cannot be settled locally, but require visits to Washington for settlement. Information must be used before it is filed; somebody must read new releases and study their impact on the business. Somebody must coordinate the jobs of the workers added to the department for handling details. Somebody must look ahead and spot changes which seem likely to occur in the materials supply set-up and prepare the company for eventualities as well as possible.

The Purchasing Agent in a company of any size will not have the time to do this. If, in any company whose priorities problem is now significant—and that includes most of them which are still operating—the handling of the problem is to be under the control of the Purchasing Agent, a responsible subexecutive is urgently needed to take control of the work directly, and release the time of the Purchasing Agent for handling of his more immediate problem of finding sources of supply, and keeping the goods coming in.

Some justification can occasionally be found for placing priority control under the direction of the sales manager. He is, perhaps, less burdened with work than most of the organization in a majority of cases, and he has more time to deal



with new problems. Further, he uses information about priorities extensively in dealings with customers.

However, his need for priorities information is hardly so urgent as is the need of the Purchasing Agent. This factor is so important that special circumstances must be present to justify placing the control of the problem under the sales manager.

Such special circumstances are not unheard of, however. In many cases, priority regulations are established in Washington without adequate knowledge on the part of the government agencies of the uses to which the product in question may be put. In such cases, it is possible for a company which sells the material in question to help the government by going to it with information as to ways in which established regulations are unfair or inadequate, and getting them changed. Such information would in all probability come to the company through the sales department, as it would be more familiar with the uses of the end-products of the company than would any other department. It would, then, be of benefit to the company to have control of priorities in the hands of the sales manager, as he would use it extensively in dealing with customers, and would, furthermore, use such information in a way that would require intimate acquaintanceship with it.

Dealing With Customers

Furthermore, if the company manufactured items for which the purchase required priority ratings, and made them from materials which did not require priorities, the sales manager might be the logical man to handle the priorities job. He would be best able to deal with customers, both for the sake of keeping up good relations with them and, possibly, for detecting violations of the regulations on the part of customers or flaws in the regulations which should be pointed out to Washington.

Other departments are less directly affected by priorities, and have less contact with outsiders than purchasing and sales. Consequently, it is not frequent that the priorities job is placed under the control of heads of other departments.

Briefly summarized, then, it may be said that in any company at all concerned with purchase of materials for which priority ratings are concerned, the entire organization will be interested in priorities information, but the Purchasing Agent will be the most immediately affected. Only in the somewhat less ordinary cases in which the company contacts the priorities problem more urgently and constantly in sales than in purchasing will another department feel the impact more heavily, and only in such cases should the control of the priorities function be put under the control of the sales manager.

A Fact-Finding Job

However, the central fact must be recognized that the priorities controlling organization is primarily a fact-finding and fact-supplying body for the use of all departments of the business. It is not identical with any other function, although its close relationship with purchasing is recognized. There is, therefore, a strong case for the establishment of a separate department, under a head responsible only to the top management, for the control of priorities. Such a department in most instances lends itself more easily to the necessary close cooperation with the various departments of the business, and is in a better position to decide matters of priorities without prejudice than is a department under the control of another department, where relationships with customers or suppliers is emphasized. Furthermore, it makes possible a clearer distinction between the job of handling priorities in accordance with both the letter and the spirit of the law, and other jobs—purchasing or sales, for example. Relationships with the departments with which it must deal, too, are more likely to proceed amicably and smoothly if there is no reason or excuse for claims that the matter is being handled with especial regard to the interests of one department, or without regard to the needs of some departments.

Government Contacts

The organization of the priorities handling division, regardless of its place in the company organization, presents problems. How can contacts with the government best be maintained? How can relationships with other departments of the company best be handled? How much of the job of handling priorities should be centralized in the department, and how much should be left to the other departments of the business? These and many other questions arise, and must be decided in each individual instance on the basis of the facts of the case.

The question of relationships with the government is a complex and changing one. Many companies have found it necessary to keep a man in Washington in order to expedite priorities ratings which are needed in a hurry. This is not necessary in all cases. If it is necessary, obviously, the organization for handling priorities at home cannot be controlled by the Washington representative. The head of the priorities department of a company may make fairly frequent calls to Washington and still keep his department running, of course, but essentially, there must be someone at the office at all times with some knowledge of the general picture in order to carry on.

The future of organization for handling relationships with the government is not, at present, clear. Emphasis is being put on decentralization of the W.P.B., for example—that is, real decentralization of authority into regional offices. It may be that the need for contacts direct with Washington will be less in the future, and that more of the important matters can be handled locally. This would, of course make it less necessary for companies to maintain Washington representatives. However, until progress toward decentralization has proceeded farther than it has to date, there is little evidence to go on which would dictate removing Washington representatives. Probably it will not be possible at all, as in many instances Washington is and must remain the nerve center of the system, and decisions cannot all be made in outlying branches.

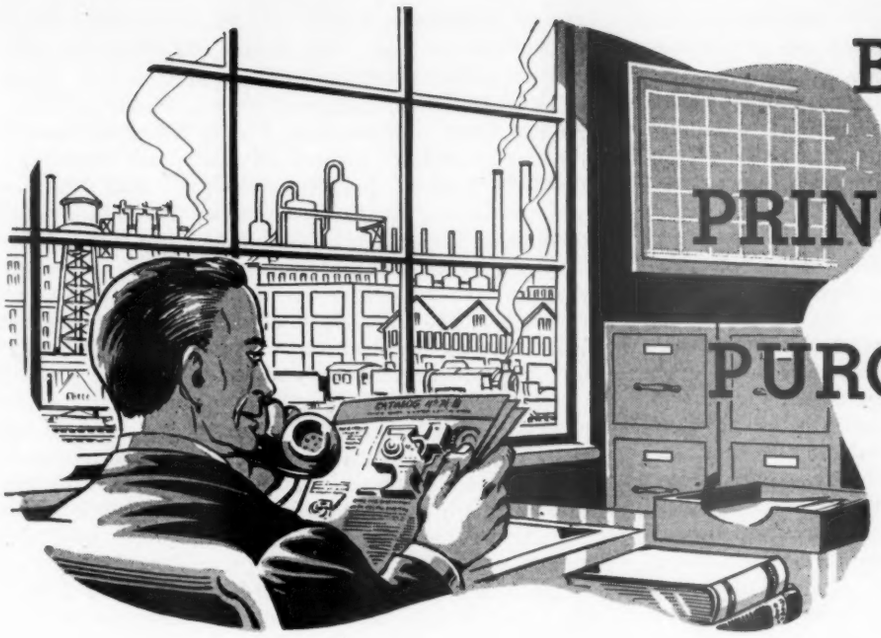
Coordinating the Work

The head of the Priorities Division, and perhaps in the case of companies with a great deal of contact with priorities administration, more than one person in the company's department, should attempt to become acquainted with the local representative of the Priorities Division. It is easier to deal with a friend, or even just an acquaintance, than it is to get action out of a mere voice on the telephone. And in the majority of cases, it is the local representatives with whom most contact will be had.

It has been pointed out above that the company's priorities organization depends for much of its information on other departments of the company, and that these depart-

(*Continued on page 210*)

This paper was awarded a cash prize from the Boffey Memorial Award Fund in the Students' Educational Contest sponsored by the National Association of Purchasing Agents. Mr. Elliott is a student at the Graduate School of Business Administration, Harvard University.



BASIC PRINCIPLES of PURCHASING

VII: PURCHASING RESEARCH

AS in every other science, the sound and effective practice of the science of purchasing depends on a continuing process of research. No purchasing department is free of this necessity, though perhaps the vast majority of purchasing men would not dignify it with the scientific term and would perhaps not recognize it as a special or separate phase of their responsibility, accepting it rather as a natural and essential part of the act of buying.

In the physical sciences we speak of "pure" and "applied" science, the former dealing with the discovery and development of basic theories and laws governing the field, while the latter deals with the useful application of those laws to a specific practical problem or set of conditions. Both phases have their counterpart in the business science of purchasing. It is with research of the second type that we are concerned here.

Sources of Information

It has frequently been pointed out that the Purchasing Agent's stock in trade is information—information that is very broad and varied in its scope, touching upon materials, industrial and marketing procedures, economics and business conditions, legal principles and special governmental regulations, sources of supply for a wide range of products, costs and values, all in addition to the particular techniques of exercising his function in the business organization. In some areas of this broad field, his information must be complete, technical and detailed, so that he becomes a competent specialist in respect to the materials of greatest importance in his company's requirements, or the commodity and product groups which are his special buying responsibility, dealing with the supplier on equal terms of familiarity with and knowledge of all phases of such items; in other areas his information may be more general, and may even consist of knowing how and where to find the specific information rather than trying to make it a part of his inherent personal equipment. But the information must be available to him as the basis for carrying on the procurement program and for making his purchase decisions. In the sense of securing this necessary information as to what, when, how, how much, and where to buy, in respect to the thousands of items that every purchasing department is called upon to procure, purchasing actually is a research operation.

An Elementary Example

A very elementary example of a problem in purchasing research is the frequent case where a product or part or tool is placed upon the Purchasing Agent's desk for the first time, with a requisition. To effect the purchase he must find the answers to a number of questions: Who makes it? Where can I get it? Where can I get it most advantageously? Where can I get it most quickly? In the majority of cases, the resourceful Purchasing Agent will be able to develop the necessary information, but there will be instances where the item is of a special nature or where no means of identification exist. Then his research will need to go a step farther: Who can make it? Who makes something like it? Who makes something that will serve the same purpose? The problem is still primarily one of sources, but it now involves knowledge of materials or products and of their use or application.

Assuming that as a result of such inquiries a satisfactory item has been located and bought, the department's service function, or the bare act of procurement, has been accomplished, and that may be all that is required under the circumstances. But it can hardly be claimed that there has been a scientific job of purchasing done, nor any sound basis established for a purchasing program. Now suppose that this product becomes a regular item of purchase. Immediately the research must be extended: Where can I find a satisfactory alternative source of supply? And how can I compare the relative values offered? The problem has now progressed to the point where decisions have been

made and the source information is recorded in the purchase record. But there still remains the question—a continuing question as long as this material or product is among the company's regular requirements—Are my present sources of supply the best sources? And our research thus far has been pretty much confined to the factor of "where", with all the other factors still to be considered.

This problem has intentionally been made a very simple one, for purposes of illustration. It is seriously to be doubted that any Purchasing Agent would consider it in terms of a research project, or that he would consciously break it down into the various steps indicated. Yet essentially it is different only in degree from the problem of the Purchasing Agent for a new war production facility, starting from scratch, who spent a large proportion of his time for the first six months of his assignment in finding, investigating, inspecting and approving upwards of 300 potential sources of supply on which the success of his own operation would depend. That research took the Purchasing Agent twice across the continent. To continue the work, he established purchasing department offices in four key industrial areas—not as buying offices, but for field research in finding appropriate manufacturing resources that might be enlisted in the supply program. Only after this essential groundwork of research had been established was he ready to purchase.

The scope of purchasing research, as previously indicated in the summary of various types of information required, touches many phases of the materials involved, and calls for as many different methods of approach. Some of the broad categories, in addition to the quest for sources of supply mentioned above, are the following:

Technical data on materials. Includes knowledge of properties, normal use applications, use as substitutes for other materials, possible substitutes for such materials. Sources of information (besides data furnished by suppliers and their representatives) include the technical departments and facilities of the buyer's own company, and tests made in the buyer's plant on samples.

New equipment. Studies fundamentally based on output and efficiency, but must include special considerations of acceptance by using departments, correlation with other existing plant equipment, estimated savings in production cost, amortization, disposition of equipment to be replaced. Generally bought on special appropriations, such research is necessarily a joint project in which purchasing, engineering, operating, financial, and general management will participate. The chief responsibility of the purchasing department on such a problem is in respect to costs and availability, and in the initial survey to determine what types of such equipment are on the market.

Manufacturing methods. There is a two-fold responsibility here. Research starts at home with a thorough understanding of the company's own operations as they affect requirements and conditions of use. Then for purposes of procurement the Purchasing Agent will need a knowledge of the processes and facilities of potential suppliers, both industry-wide and in respect to individual plants. A policy of plant visits and personal inspection is the most direct and reliable means of acquiring this information.

Cost analysis. A breakdown of quotations and purchase prices into their major component elements to provide an objective standard of values, beyond the mere comparison of bids. A more detailed discussion of this process was given in the preceding chapter.

Economics, markets, and business trends. There is a large amount of statistical data available in this field, in the form of government and industry association reports, standard indices of industrial activity, carloadings, factory payrolls, wholesale and retail sales volume, etc. Also professional interpretation of these conditions in numerous economic and business advisory services. Interpretation, however, is a responsibility that can not be delegated, and it is customary, where reliance is placed in such advisory services, to use at least two or more of these opinions as the basis for forming an independent judgment.

Regulations. The validity of purchases rests fundamentally upon established contract law, and in recent years there has been a strong trend toward increasingly detailed regulations defining what is permissible in sales and purchasing policies, acts, and relationships, culminating in the highly complicated government rulings applicable to wartime procedure, most of which affect materials, their use and distribution. There is also the closely related question of excise and processing taxes. Knowledge of legal principles is a highly valuable asset in purchasing, but legal research such as that involved in the preparation of a contract form or the phrasing of contract clauses to meet special conditions, is not a proper activity of the purchasing department; if the company maintains a regular legal department, or if one of the officers is a qualified attorney, that is where such research belongs—otherwise it is a matter for reference to legal counsel. To a much less extent have tax departments, or financial departments handling tax problems, taken the responsibility of anlayzing excise and processing taxes that affect purchased materials. These factors have been considered quite generally to be an element of cost coming within the purchasing department's scope. Where specialized tax counsel is available to the buyer, it is highly desirable to take advantage of it; otherwise there is a vitally important and highly complicated research project involved in order to arrive at sound policy and decisions.

In respect to the wartime regulations, a large proportion of which deal with the distribution, stocking, application, and price of materials, the responsibility for knowng what rulings apply, as well as for the observance of proper methods and the keeping of requisite records, has logically been assigned to the purchasing department in the vast majority of cases. In an operation of any size, this has generally resulted in the establishment of a "priorities section" within the purchasing department, combining the functions of research and administration so far as these rulings are concerned.

Organization for Research

In providing for the necessary research incident to purchasing, the purchasing department of a large company may be permitted a complete organization, staffed with a purchase engineer, economist, statistician, priorities specialist, librarian, etc., and maintaining its own laboratory. The yardstick for determining whether any or all of these facilities are justified is the practical, common sense question of whether there is enough work of the sort required to warrant a full time assignment for the purpose, and whether the results are worth the expense. Is there enough statistical work in research, calculation, charting and posting of data to

occupy a person's undivided time and attention? Or is the catalog and reference library used so frequently and constantly that a librarian's services would be useful and convenient? If so, those functions will probably be handled more adequately through the employment of skilled workers in those fields, with definite responsibility. But in many companies it will be found entirely satisfactory, and far more economical, to place the statistical work under the chief clerk's jurisdiction and to handle the catalog library as a part of the general filing responsibility.

One of the first principles is to avoid duplication of facilities. For example, there will be many instances in which the purchasing department may require laboratory test services for technical evaluation of materials and products, but very few instances in which a special laboratory for this purpose would be warranted. Such research can be amply served by utilizing the facilities of the company's technical departments set up for general research, control, acceptance tests and analysis, etc. In such cases, the Purchasing Agent should develop a relationship and routine for prompt handling of tests and standard methods of reporting the results and recommendations. If such facilities are not available, the services of commercial laboratories may be used. There are many conditions under which such an independent test and appraisal has particular advantages.

The Purchase Engineer

An increasing number of purchasing departments are finding it advisable and efficient to center the various technical phases of purchasing research and service in a member of the staff known as the Purchase Engineer. There is no standard "job specification" to define the duties of such an individual, which will vary widely with the type of company and the type of problems encountered, but some representative examples will indicate the extent of the possibilities of this position.

The Purchase Engineer is not directly engaged in procurement work, but is essentially a technical consultant to the purchasing officer, and is definitely a member of the purchasing staff rather than coming within the engineering department personnel. The question may logically be raised—particularly in view of the principles stated in the preceding section—whether this does not constitute a duplication of personnel and function which might better be handled through closer coordination of the major departments involved. The answer to that question lies in the respective viewpoints represented by purchasing and engineering departments. However closely and harmoniously they may work together, and bearing in mind that both are working toward the same end of the company's best interests and profitable operation, they represent, by training and by their particular functional responsibilities, two very different types of approach which must be reconciled in order to arrive at the best decision. The engineer is primarily interested in performance, the purchasing man in value. To the extent that these factors are given first consideration, it is probable that the engineer will be a better engineer, and the purchasing man a better buyer. It frequently, though not necessarily, follows that the engineer may be careless of costs and the purchasing agent may compromise quality.

The function of the Purchase Engineer, then, is the application of technical skills and methods to the considerations of costs and values, which are distinctly in the province of the purchasing department. It has been shown earlier in this series, that the concept of quality in industrial materials and equipment has significance only in relation to the proposed application. It is quite possible that economy can be achieved by upgrading for greater workability or uniformity, even at a higher price, which will be more than offset by lower operating costs and lower percentages of rejects. It is equally possible that less expensive materials or quality might be specified without any prejudice to the utility or saleability of the product, and excessively fine (and costly) tolerances eliminated without affecting manufacturing processes, though either one of these suggestions might be repugnant to the engineer responsible for design.

Purchase Engineers are commonly assigned to the preparation of materials specifications and to the related fields of standardization and simplification in respect to purchased items. Their responsibility is to see that minimum standards of analysis, purity, precision, etc., are maintained in the specification, but without over-refinements that are unwarranted by the use requirement, and without details which would limit competition. Also to prescribe the simplest adequate tests for conformance to the specification.

They frequently specify and select such items as electric motors and controls which are purchased from outside manufacturers and attached to the company's product as accessory equipment which is essentially bought for resale. The type or make of such accessories may be specified by the customer. In that case the Purchase Engineer sees to it that the selection is properly adapted to the need, and that the composite system of controls is properly balanced and coordinated to give the desired results.

Purchase Engineers make cost analyses, not only on bid comparisons involving technical factors, but in a more general sense wherever fabricating methods and other industrial processes are a considerable factor, and they may work with suppliers toward the development of more efficient and economical methods.

They prepare bills of materials and cost estimates in advance of manufacture.

They handle research on special projects such as the purchase of new equipment, and the possibilities of substitution.

These are representative duties which combine the requirement of technical competence and the purchasing viewpoint, without infringing on the responsibilities or prerogatives of any other department. The exercise of these functions on a regular basis, with fixed responsibility, plus constant availability for technical consultation with the buying staff on a multitude of details that might otherwise call for reference to plant or engineering departments—with initial delay and later interruptions for follow through—offer many advantages in the conduct of a purchasing program. A survey of the amount of such work to be done in any purchasing department, together with a consideration of the technical qualifications of the buying staff and the amount of time they have at their disposal for this type of activity, will determine whether the services of a full-time Purchase Engineer would be warranted in any individual case.

The Research Schedule

Most purchasing research is prompted by specific problems as they arise. In a broader sense, the opportunity is presented whenever an item comes up for reorder, particularly at the contract expiration season

—one of the many potent reasons why contract periods should be staggered so far as possible to permit due consideration rather than routine renewal of purchase arrangements.

Examination of research accomplishments in scores of purchasing departments indicates that the research activity is generally pretty uneven; and also that serious attention to special projects very often results in rather astonishing improvement, with savings multiplied in repetitive transactions. Almost every department can point to one or more cases of studies which led to substantial savings. It may be in a major item such as brass, alloy steel, stampings, or fuel; in major equipment such as transmission or materials handling, or in relatively small unit supplies like cutting tools or lead pencils; in lighting equipment, floor treatments, lubricants, cleaners, or product finished; and in occasional items like stock certificates, fire hose, or fireworks! In other words, the potential field is unlimited.

The obvious moral to be drawn from this is the suggestion that, so far as time and facilities permit, the research program should be extended so that over a period of time it will embrace as many as possible of the major items in the purchasing list. Research at the time of contract renewal has already been mentioned; it has the logical advantage that contract materials will normally represent the items of greatest volume and importance in the purchasing program and consequently may be expected to offer the greatest potentialities. Another circumstance naturally prompting a research project is in connection with the testing of vendors' samples. If the product or material is sufficiently important to warrant testing, the test is significant chiefly in comparison with the item which it is proposed to replace, and it follows that the product or commodity group as a whole is deserving of special study. That is still rather a "hit or miss" program. Every buyer should be encouraged to review the entire list of materials coming within his jurisdiction and to institute an orderly program of investigation beyond the routine consideration of individual purchases—first among the items of major importance, and eventually covering the complete list. The educational value of such a program, and the general alertness resulting from such a policy, are far reaching, even beyond the tangible improvements or economies which may be effected.

Recording the Information

Another important principle of research is to record the information for ease of reference, so as to avoid the necessity of repeating the process in the event that a similar problem should arise at some future time. This does not imply that any findings or decisions are necessarily permanent. Industrial conditions are never static, and constant technological advance is one of the outstanding characteristics of our industrial civilization, the field in which the Purchasing Agent works. Research must take these changes into consideration and go along with them. It is a continuous process, but each specific study that is completed should advance the starting point of the next study on that subject, rather than starting all over from the beginning.

For example, acceptance by operating executives and workers is an important factor in the selection of many operating supplies. For reasons which may be difficult to explain, the plant man may not only be convinced, quite sincerely, that he can get better results with some brand that he has been accustomed to use,

Form 893

THE BUCKEYE STEEL CASTINGS CO.

Mr. _____
Copy to _____
Copy to _____
Copy to _____

Notice of Arrangement for Trial of Material or Equipment

No. _____
Date _____
Subject _____

We have authorized _____
to send us for purpose of {Laboratory Test / Factory Test} the following material _____

Proposed Use _____

This (is not) covered by an order _____ Order No. _____ Date _____
You will be notified when material is received.
Please arrange to test this material as indicated above and furnish report of results.

Signed _____

RECORD OF RESULTS

Please answer the following for complete history of test for future reference:

I. Where was material tried _____

II. How does material compare with material now standard (Better _____ / As good as _____ / Not acceptable _____)

III. If in your opinion product is better, give reason _____

IV. Would you like more of this product for further trial? _____ How much _____

V. If product is as good as, but no better than product we are now using, would you object to a change, if there is a price advantage? Yes _____ No _____

If answer is Yes, state reason _____

VI. If product is not acceptable, state reason _____

VII. Remarks _____

Signed _____

Analysis slips, sieve test reports or any memoranda that has bearing on results of test, should be attached to Purchasing Dept. copy.

Keep duplicate for your file, send original to Purchasing Dept.

Systematic handling of tests and samples, and properly recording the results, is an important part of purchasing research.

but seems to get no results at all with other materials. A change in plant personnel may consequently precipitate the demand for a change in materials, sometimes made in the honest conviction that this demand constitutes a real contribution to plant and purchasing efficiency. Such a situation frequently causes friction between departments, or entails a whole new project for the purchasing staff. But if the initial research has been adequately made and properly recorded, the solution may be relatively simple—either indicating that the new man's preference can be met without any prejudice to purchasing policy, or providing the evidence to show that the current selection had been made for definite reasons more cogent than mere familiarity with a competing product.

Much routine research covering factors of a commercial nature, such as alternative sources of supply, comparative prices and terms, transit time, manufacturing cycle, and the like, can be incorporated directly in the purchase or price record, where it automatically comes to the buyer's attention whenever an order is in process of being placed. Specimen forms reproduced in connection with previous articles in this series illustrate how this is facilitated by proper form design.

More specific instances, such as analysis of new equipment, tabulation of bids, reports of tests, etc. are generally included in the file folder of the particular order to which they apply. There are advantages in this method, in that it provides the complete story of the transaction, not only historically, but with the reasons or justifications for the decision. To the research-minded purchasing executive, however, there is a dis-

advantage in that the folder is successively relegated to the completed order file and then to dead storage, making it increasingly difficult to use as reference, and is eventually destroyed. With it goes the tangible result of research that has cost time, effort, and expense, and that might be of considerable value in some later comparable transaction. In the case of equipment purchases it is customary to hold the folder for a longer period, and perhaps for the life of the machine, and on contract purchases it is generally retained at least until the contract comes up for renewal. But in scores of repetitive items, where the chief value of the research lies in the cumulative effect of its application on recurring purchases, the record is too often "lost in the files."

To meet this situation, without unduly complicating the file and record system of the department, a number of progressive purchasing organizations make it a practice to keep a separate file of test reports and engineering recommendations, and also maintain a general information file in addition to the usual catalog library, where research developed within the department can be retained along with the information from other sources. Such a file is described in another section of this article. It is tied in with the regular purchase record file by making a notation on the latter, containing the reference as to where this data may be found; thus it serves the dual purpose of supporting the original transaction, and of becoming available as a more permanent source of information without duplicating the work involved.

Standard References

A good deal of the basic general information for purchasing research is embodied in standard reference works which are the foundation of the departmental library, while information of a more timely current nature is available through periodical publications and business services.

A comprehensive directory of manufacturers is essential. This will probably be supplemented by one or more of the directories covering specific fields pertinent to the company's operations and supply requirements, such as a directory of paper mills, textile mills, coal operators, foundries, etc. The specialized directories are generally more detailed in the information which they offer, including data on facilities, equipment, output, number of employees, and special products. Where materials and supplies are drawn from a more limited area, there are some excellent compilations issued by state manufacturers' associations, metropolitan chambers of commerce, and similar organizations. The local classified telephone directory is another valuable source of information that is sometimes overlooked.

Almost every major commodity field also has its data book covering trade definitions and trade customs, standards, standard units, and the like. Many of these are published annually, so that the information is kept reasonably up to date. Allied to this group are engineering manuals, conversion tables, packing and shipping guides, etc.

Government publications, even with the curtailment of this program as a war measure, provide reliable data on a wide variety of industrial and commercial topics. The bulletins of trade associations likewise contain valuable information slanted to the particular interests of their field. Industrial and business publications offer an indispensable service both for current reading and for permanent reference. For reference and research purposes, the information sources cited in this paragraph are generally inadequately indexed, and it is open to question whether there is any practicable system of subject indexing which would coordinate directly with the classifications appropriate to the particular needs of any substantial proportion of their clients. To get the greatest value from such material, the simplest solution is to institute a systematic practice of clipping pertinent articles and filing them in the general information file.

Business and economic services are used primarily for their interpretation of current conditions. They are most conveniently kept in the special binders available for this express purpose. The accumulation of statistical data which makes these studies particularly valuable as background material, can be obtained in a number of annual statistical handbooks dealing with the general commodity situation or with specialized fields. The services devoted to wartime regulations are in a somewhat different category, since the complete record or a recapitulation of it is necessary as the basis for understanding revisions and the extension of orders; as a separate and special subject, the separate file and index is the most workable arrangement for handling such information.

Catalog File

Essential as a working tool of the purchasing department, as well as a primary information file is the catalog library. In the small company, with a relatively limited range of material requirements and generally with few and rather well established sources of supply, this is not likely to be a serious problem. The catalogs are kept on shelves in the Purchasing Agent's office, and the familiarity of constant use enables the buyer to put his finger on the desired catalog without too much trouble. Under such circumstances, it is probable that the maintenance of a catalog index would represent more trouble and expense than it is worth—an ever-present danger in respect to all "systems." But in an organization of even moderate size, the catalog library quickly grows to such proportions that memory is no longer a dependable guide as to what it contains in the way of essential information, much less as to where that information may be found. There is the further complication that much of this material comes in leaflet or circular form, poorly adapted to shelf filing or finding. A simple system of filing and indexing then becomes imperative.

The absence of any generally accepted standards as to catalog style and size raises a problem of physical disposition and arrangement, and further emphasizes the need for an index, since the ordinary alphabetical system, either by subject or by supplier's name, is not applicable.

The most convenient and sightly arrangement, as well as the most economical of space, is to segregate those catalogs which, by virtue of size and binding, can be kept on ordinary bookshelves, and to arrange them according to size. Each such catalog is then assigned a definite shelf location which, for convenience in replacing, is marked or stamped clearly on the catalog. Whether the arrangement shall be further refined to the point of assigning a particular position on the shelf or identifying each with a code or serial number is a matter for individual determination, depending largely on the extent to which the catalog library is used and how many of the catalogs are habitually withdrawn for reference use. The simpler the arrangement, consistent with the requirements of use, the more

CLASSIFICATION OF COMMODITIES
(National Bureau of Standards)

000-099—*Animals and Animal Products (Except Wool and Hair)*
- 000—Animals
- 010—Meats
- 020—Dairy Products
- 030—Fish
- 040—Animal and fish oils, fats, and grease
- 050—Hides and skins (raw except furs)
- 060—Leather and leather manufactures
- 070—Furs
- 090—Miscellaneous animal products

100-199—*Vegetable Food Products, Oilseeds, Expressed Oils, and Beverages*
- 100—Grains and preparations
- 110—Fodders and feeds
- 120—Vegetables
- 130—Fruits and nuts
- 140—Oilseeds and vegetable oils and fats
- 150—Cocoa, coffee, tea, condiments, and leavening agents
- 160—Sugar, molasses, sirups, honey, and confectionery
- 170—Beverages

200-299—*Vegetable Products Except Food, Fibers and Wood*
- 200—Rubber and similar gums and manufactures thereof
- 210—Gums, resins and balsams
- 220—Crude drugs and essential oils
- 230—Dyeing and tanning materials of vegetable origin
- 240—Seeds (except oilseeds)
- 250—Nursery and greenhouse stock
- 260—Tobacco
- 280—Starch and vegetable glue
- 290—Miscellaneous vegetable products

300-399—*Textiles*
- 300—Cotton, cotton fabrics, and knit goods
- 310—Manufactures of cotton
- 320—Jute and jute manufactures
- 330—Flax, hemp, and ramie
- 340—Other vegetable fibers, straw, or grass
- 360—Wool and hair, and manufactures thereof
- 370—Silk and manufactures thereof
- 390—Miscellaneous textile products

400-499—*Wood and Paper*
- 400—Lumber (logs, timber, and other manufactured or partly manufactured wood)
- 410—Lumber for building and factory use
- 420—Manufactures of wood (except furniture)
- 430—Furniture of wood
- 470—Paper (except printed matter)
- 480—Books and other printed matter
- 490—Miscellaneous paper products

500-599—*Nonmetallic Minerals*
- 500—Coal, petroleum, asphalt, and mineral wax
- 510—Stone, sand, and cementitious materials
- 520—Glass and glass products
- 530—Clay and clay products
- 540—Abrasive materials, asbestos, and chalk
- 550—Mica and rare minerals
- 560—Precious stones and imitations
- 570—Sulphur, magnesia, salt, and graphite
- 590—Other nonmetallic minerals

600-699—*Ores, Metals, and Manufactures (Except Machinery and Vehicles)*
- 600—Iron and steel
- 610—Iron and steel manufactures
- 620—Ferro-alloying ores, metals, and manufactures
- 630—Aluminum, antimony, bismuth, cadmium and cobalt
- 640—Copper, brass, and bronze
- 650—Lead, mercury, and nickel
- 660—Precious metals, jewelry, and plated ware
- 670—Clocks, watches, and dials
- 680—Tin and zinc
- 690—Other ores, metals, alloys, and metal manufactures

700-799—*Machinery and Vehicles*
- 700—Power-generating machinery (except electric)
- 710—Electric machinery and supplies
- 720—Vehicles (except agricultural)
- 730—Agricultural machinery and implements
- 740—Construction, conveying, and hoisting machinery
- 750—Mining, oil well, and pumping machinery
- 760—Metal working machinery
- 770—Textile, sewing, and shoe machinery
- 780—Other industrial plant machinery
- 790—Miscellaneous industrial plant auxiliary equipment

800-899—*Chemicals and Allied Products*
- 800—Coal-tar products
- 810—Medicinal and pharmaceutical products
- 820—Acids (except coal-tar), anhydrides, alcohol, etc.
- 830—Other chemicals
- 840—Pigments, paints, and varnishes
- 850—Fertilizers and fertilizer materials
- 860—Explosives, fireworks, and ammunition
- 870—Soaps, cosmetics, and toilet preparations
- 880—Disinfectants and water treatments
- 890—Miscellaneous chemical products

900-999—*Commodities Not Elsewhere Classified*
- 910—Scientific and professional apparatus and supplies
- 920—Musical instruments
- 930—Office, printing, lithographic, and educational supplies
- 940—Toys, athletic and sporting goods
- 950—Containers
- 970—Fire-extinguishing apparatus and supplies
- 980—Brushes and brooms
- 990—Miscellaneous articles

effective will be the system; in most purchasing departments, the shelf number alone is considered sufficient.

This leaves the problem of the very considerable number of pamphlets, circulars, etc., which are an essential part of the catalog file, but which do not lend themselves to shelf storage. One method is to bind these into file folders which can be placed upon the shelves. It has the advantage of keeping the entire catalog library in one unit; it has the disadvantage that such folders rarely lend themselves to legible title or subject identification on the "backbone" and are consequently rather difficult to find and to replace in the proper position. A simpler method is to insert them, with or without binding, in file folders to be kept in an ordinary vertical letter file. The usual arrangement is alphabetically, either by suppliers or by products, the latter being in more general use. With an alphabetical arrangement of this sort, the location index may be dispensed with, but it is customary to show at least the drawer number. In any case, the material should be included in the catalog index to indicate what is available on any given subject.

Reference to the catalog file will be either by supplier or by product, depending on circumstances, and both of these items should be shown in the card index. This can be done either with two separate sets of card indices, or with a composite index, using white cards for the product classifications and colored cards for suppliers' names. Sometimes this is further refined by

using two color, one for manufacturers and one for distributors. The composite index is in most common use. There will frequently be the necessity of several different card references to a single catalog, as in the case of a manufacturer making a variety of products or the distributor carrying a diversified line. The more detailed the product index, the more useful it will be.

Indexing Systems

It should be noted here that a number of scientific methods of classification have been developed, corresponding in principle to the decimal systems employed in general library practice, and comprehensively covering the entire commodity field. The best known of these is that used in the National Bureau of Standards, which is shown in the accompanying table. Architectural materials have also been classified for the particular purposes of reference in that field, and similar projects have been developed to cover other specialized materials requirements.

All of these doubtless have special merits of their own, but in the average purchasing department the most useful index will follow the classification and sequence used in the listing of materials in the purchase record, since reference will in most cases be prompted after consultation with the purchase record, and it is of course important that all records within the department be coordinated.

In suggesting this materials classification, it is recognized that the headings will not be uniform among all companies, since the structure of the purchase record reflects the relative importance of materials in companies of widely varying requirements and types of operation. In one company, for example, where chemicals are a minor item of purchase, the whole range of chemical products might be grouped under the one heading "Chemicals." In another company, where such purchases are in large volume and variety, representing one of the principal requirements, there might be a score of major headings for chemical items, scattered all the way through the alphabet. Or, to take another example, one company might group all of its copper purchases under "C":

Copper, bar
Copper, roll
Copper, sheet
Copper, wire

whereas in another company, perhaps with comparable requirements, the important classification might be "Wire," way down at the other end of the alphabet:

Wire, copper
Wire, insulated
Wire, iron
Wire, steel

To state the rule that the "principal noun designation" should be used does not clarify a situation of this sort, for the importance varies as between different organizations. But for purposes of reference, the rule that catalog classifications should follow those of the purchase records seems to be thoroughly sound.

Using the Catalog File

There are large organizations where a general library is maintained, or even departmental libraries of sufficient size to warrant the employment of a librarian to administer the catalog library along with other reference material. In most cases, however, it is found satisfactory to handle this as a part of the filing responsibility, along with correspondence and order files, in charge of the filing clerk or chief clerk of the department. Some arrangement of this nature is preferable to permitting free access to the catalog material, as even a simple system can easily become disorganized, resulting in confusion and the loss of material. If certain catalogs are in constant use by one or more buyers, it is advisable to secure duplicate copies for their desk use, with a regular file copy on the shelves to keep the library complete for general reference.

The duties of the librarian, or of the clerk having this responsibility, include:

Entering and indexing all catalog material.
Keeping the library up to date with current editions to replace those which have become outdated.
Inserting new pages or sections in loose-leaf catalogs as received.
Securing extra copies as required.
Issuing catalogs to buyers or other users as required.
Keeping track of the location of loan copies and securing their prompt return to the files.
Replacing material in the files.

The mechanics of handling the file are simple. The essential forms are the composite card index described above (which need not be a printed form) and an "Out Card" to be inserted in the index whenever a catalog is removed from the file. This is a card projecting above the top edge of the index cards so as to provide a visual signal. It contains the identifying number or title of the catalog on loan, the name of the borrower, and the date taken, thus showing the location of the catalog and where it can be found if it is out of the files. The more elaborate records of general library practice are rarely necessary.

Commodity Information File

Many industrial catalogs contain valuable technical and engineering data, tables of weights and dimensions, conversion tables, instructions as to applications of the product, recommended methods of use, maintenance and storage, and the like. But the great bulk of such information—invaluable for the understanding of a material or product and for making a wise purchase decision—comes from other sources, such as items and articles in the trade magazines, reports of scientific societies, and trade literature which is not properly classified as catalog material and has no place in the catalog file. In all too many companies there is no systematic program of assembling, filing, and indexing this information so that it may be available at the moment when it becomes pertinent, or even vital, in meeting some problem of materials and supply. Trade publications and associations are deluged with inquiries from subscribers or members who have a vague recollection of some item published a few months or even years earlier, and the references are frequently so indefinite or inaccurate that little help can be given or only after extended search and delay.

Yet the answer to this situation is relatively simple. As worked out in a number of successful purchasing departments, it is in the form of a commodity information file—an ordinary correspondence file with folders corresponding to the commodity classifications of the purchase record. As the Purchasing Agent goes through his daily mail, there is notoriously a good deal of material to be discarded immediately; that does not constitute a serious problem. But there is also a good deal of material of immediate interest, and much which he recognizes as of potential value. Instead of accumulating this in a miscellaneous pile where it is effec-

tually buried and eventually destroyed, he marks it with the appropriate product classification and it goes into the proper folder in the information file for future reference. The same process is applied to his reading of business publications, clipping advertisements and editorial articles for similar dispositon. It is easy on the memory, and over a period of time it provides a mine of pertinent information on a wide variety of subjects which literally can not be duplicated in any other way. If he uses reasonable discretion in his selection of material, there will be surprisingly little accumulation of information on the dubious basis that "it might come in handy sometime," and the filing space devoted to this marginal material is far outweighed by the many instances in which he finds ready to hand the exact item for which he is seeking or the clue to the solution of some unfamiliar or difficult problem.

Testing of Samples

Another phase of purchasing research is the testing of samples submitted by prospective suppliers. Properly conducted, this procedure is one of the most practical means of evaluating materials and products, in a specific application and under actual operating conditions. It is unfair to a supplier to accept a sample merely as an easy way to end an interview and to lend countenance to a casual report that it was found to be unsatisfactory. It is equally unfair within the company organization itself for the purchasing department to clutter the laboratory or operating departments with a multitude of sample lots for test if they do not promise real advantage or if the test report is not to be given full and careful attention, or for operating departments to treat these requests with halfhearted or biased attention, returning tardy and inadequate reports of the test results.

Effective handling of samples and tests is largely a matter of conscientious "follow through." Some purchasing departments make it a practice to handle samples only on the basis of issuing a regular purchase order for the material for test purposes. This dignifies the procedure, gives the company an actual stake in giving the material a thorough trial, insures a sufficient quantity to carry through the trial on a real production basis, and serves to initiate a formal procedure seeing the test through to completion. Whether or not this practice is observed, it is essential to organize the testing procedure so as to identify the material, secure a prompt and adequate analysis or trial, and a factual report of the results, with recommendations, rather than an arbitrary "yes or no" decision from the testing department.

A system in common use consists of a "Sample for Test" form issued by the purchasing department in triplicate. Two copies are sent to the department where the test is to be made, and the third is retained as a file record and for follow-up. When the test is completed, the results are entered in detail, with recommendations if requested, by the testing department on their duplicate copies. The original is returned to the purchasing department as a report and thereupon becomes the basis of purchasing decision or action, whether for elimination of the material, further trial, or adoption.

Test reports supporting a particular purchase may be filed with the purchase order, but where there is a considerable volume of such testing it is advisable to keep a complete separate file, as a matter of record and reference, and to avoid possible later duplication of the work already done.

Making Research Pay

Emphasis has been placed in this article on the materials or facilities for research, many of which are found in the everyday equipment of every purchasing department. It is probably needless to point out that they are useless unless put to work. It is worth repeating that research does not consist in records but in specific projects, and that it generally takes the purchasing man beyond the confines of his own office, physically as well as in thought, to explore his own plant and its needs, the plants of his suppliers, and the whole commodity market.

Research is a state of mind. It requires initiative, flexibility, a broad field of information, constant inquiry, and the ability to visualize the practical application of what is seen and learned.

Many dramatic instances of purchasing research might be cited, in the substitution of materials and methods, revision of specifications, cost reduction, the breaking of supply monopolies, the discovery or development of unsuspected sources, astute timing of purchases and inventory policies. And the results go far beyond the purchase records. Such purchasing resourcefulness, to call it by another name, has kept the wheels turning in many hard-pressed industrial plants during the difficulties of wartime operation. In a recent instance, concerning a military product built to exacting specifications, the engineers and production men of a large eastern manufacturer threw up their hands in despair. They had twisted and turned, exhausted every resource of design and production ingenuity, and their bid was still high. Because of the importance of the project, they had even usurped the purchasing function and specified the sources of supply with whom they knew their competitors were dealing, and they were up against a stone wall. Then the Purchasing Agent held up the bids and took to the road. For ten days he lived with prospective suppliers, armed with blueprints and specifications. What the engineers had been unable to accomplish in their own plant, he accomplished in the plants of his suppliers, and he came back with a competitive advantage on one principal component that has resulted in the successful consummation of profitable orders running well into seven figures.

That is research at work. Fundamentally it is composed of the prosaic elements that have been detailed in this discussion—plus initiative. To a greater or less degree, the same process can be applied to every purchase transaction, and is accepted as a matter of course as a routine part of the purchasing responsibility. The glamor of a wartime setting and a million dollar sale adds dramatic force to this example, but the buyer had been schooled to the possibilities and methods of purchasing research under no such romantic circumstances. It is an integral part of the everyday purchasing process, and the efficiency of any procurement program depends on the extent to which this viewpoint and policy are maintained.

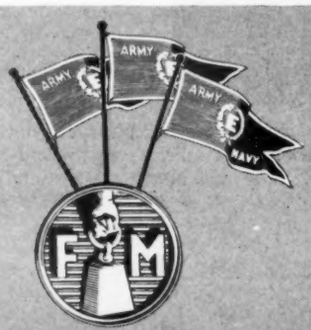
Next Month: Selecting the Supplier

-you wouldn't accept a 10% increase in power cost without a protest

FAIRBANKS-MORSE TURBINE PUMPS
The F-M line offers complete range of capacities from 35 g.p.m. to 4000 g.p.m., for electric motor, Diesel or gasoline engine, or steam turbine drive. Open or closed impellers. Oil or water lubrication.

A SUDDEN boost of 10 per cent in power rates? You'd call it ridiculous—but many ten-year-old pumps of certain types, *even if as good as new,* take 10 per cent greater toll at the meter than today's Fairbanks-Morse models! And a 10 per cent reduction in power consumption is anything but ridiculous—especially now.

Before you arrange for increased power to meet heavier production schedules, eliminate power waste. Your resident Fairbanks-Morse Engineer can tell you quickly—without cost or obligation—whether or not the pumps you have are the types that exact the penalty of obsolescence. You may discover, as others have, that new pumps would solve your power problem today—and your cost problem tomorrow. Use your priority to buy for today with an eye on tomorrow's cost sheets. Write Fairbanks, Morse & Co., 600 S. Michigan Avenue, Chicago, Illinois.



FAIRBANKS-MORSE

DIESEL ENGINES
PUMPS
MOTORS
GENERATORS
SCALES
WATER SYSTEMS
FARM EQUIPMENT
STOKERS
AIR CONDITIONERS
RAILROAD EQUIPMENT

F M

Pumps

New PRODUCTS · IDEAS

FLAME HARDENING SMALL PARTS

Bench model #501 Hy-Mac flame hardening machine was particularly designed for handling small parts. Different shapes and sizes hardened by revising multiple duty holder and changing tips on burners. Floor model #502 has base of welded steel construction, is fully automatic and was designed for the hardening of sprockets. This machine is hydraulically operated and electrically controlled. Hydraulic Machinery, Inc., 12825 Ford Road, Detroit, Mich.

PERMANENTLY PAINTING GALVANIZED SURFACES

Permanent paint adhesion on galvanized metal, with no chipping or peeling, is insured by preparing the galvanized surface before painting with Turco Redi-Paint, according to Turco Products, Inc., of Los Angeles and Chicago. Redi-Paint is said to "chemically" change the surface of the metal, giving a permanent protection and base for paint. Redi-Paint can be applied by hand or by tank immersion.

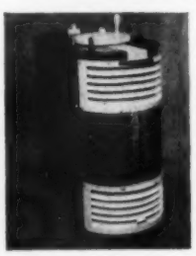
DIRECT FIRED AIR HEATERS

Direct fired air heaters for dehydration and chemical processes, with output temperatures between 150 deg. F. and 350 deg. F., the heated air being free from contamination, are announced by Dravo Corp., 300 Penn Ave., Pittsburgh, Pa. Heaters are available for oil, gas or coal as fuel. Coal heaters can be converted to oil or gas. Saving of fuel, ease of operation and flexibility are among advantages claimed.

ANNOUNCE SOLSEAL WATERPROOF TAPE

Solseal Waterproof tape, new tested and proved strapping material for overseas shipments, is announced by McLaurin-Jones Co., Brookfield, Mass. It is applied in same manner as regular sealing tape, using special Solseal Solvent as moistening agent which makes tape absolutely waterproof. Tape practically cements itself to package. It is unaffected by temperatures ranging from 25 deg. below zero, to 180 deg. F. Solseal is available in 30/30/30, 60/30/30 and 60 lb. wet strength Kraft with Solseal adhesive, also string-filled for use as strapping tape. Applicable to V-type weatherproof cartons and waterproof boxes of all types, and manufacturers state it will adhere to containers and packages for which other sealing tapes have not proved practical.

OUTDOOR A-C WELDER



A new 500-Ampere outdoor alternating current welder has been announced by the General Electric Co., Schenectady, N.Y. The welder, which has a welding current range from 100 to 625 amp. at 40 volts, is especially designed for use in shipyards and other outdoor locations where exposure to the weather is encountered. Power factor 95% or better at all loads between 40 and 70 per cent or rating, is claimed. Welder is protected against entrance of rain, snow and sleet.

SPRING TESTER WITH SIGNAL

Spring tester with sound device to indicate when the spring is compressed to test point, is announced by P. A. Sturtevant Co., Addison, Ill. Tool can be operated with any accurate, standard torque wrench—the wrench serving as both the operating lever and measuring element. Tool permits adjustment of test length of springs to 0.003 inch.

REFINED MEASURING DEVICE

Rotab is the name of a new tool that brings simplicity and speed to the task of machining as well as measuring large objects such as fixtures, castings, patterns, or fabricated parts, according to the Machine Products Corporation, Detroit, Mich. Unit has 30 inch circular table on which work to be measured may be clamped. Table can be rotated to any degree and to any angle. Rotab also lends itself as a holding fixture for boring mill setups.

COLD SURFACE PAINT STICK

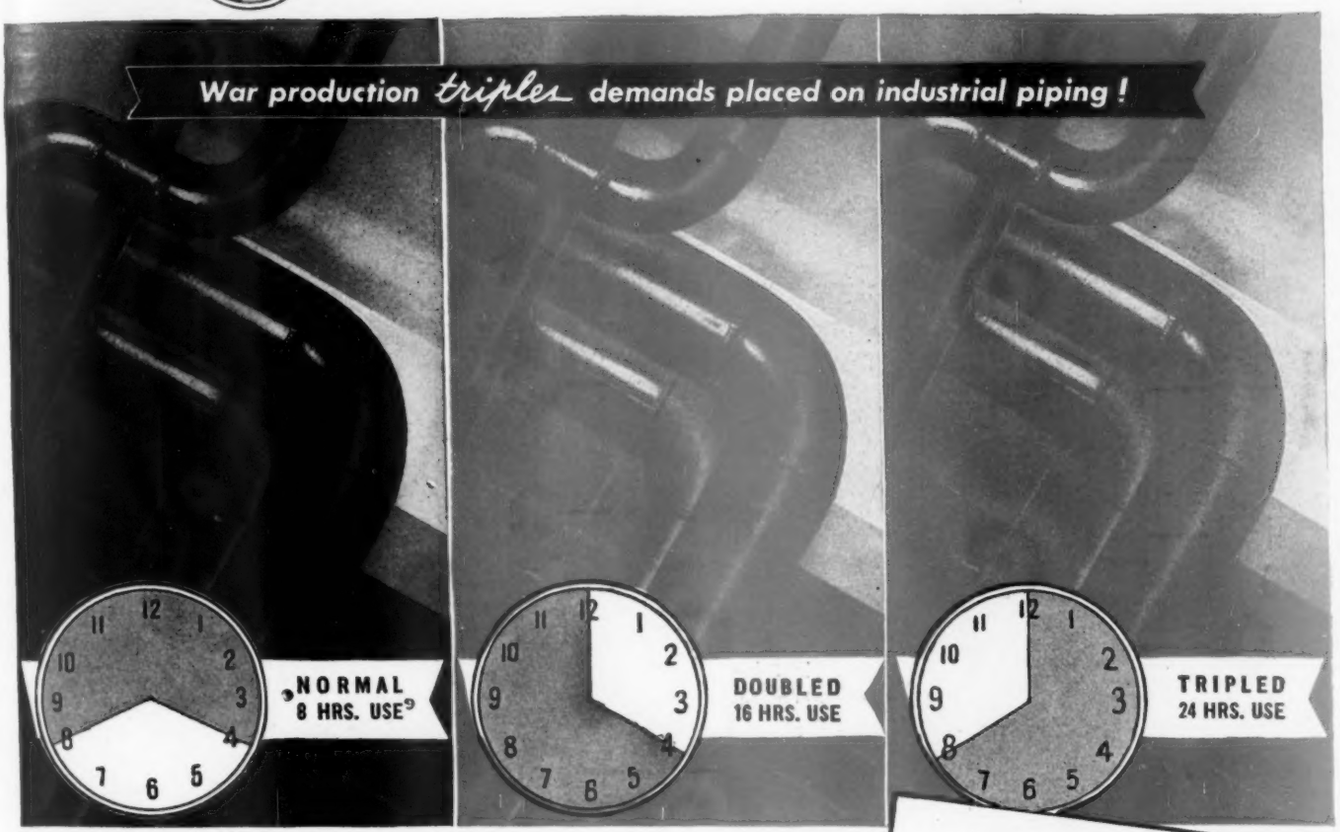
New paint stick marker for use on all cold surfaces is announced by the Markal Co., 6 E. Lake St., Chicago. Known as Markal N, it makes a wide and legible mark, producing permanent, fade-proof and weatherproof markings on mteal, lumber, rubber, stone, glass, plastics and other surfaces. It is fast drying, and comes in red, white, blue, green, yellow and black. It is said to be particularly suitable for layout purposes on steel plates whether bare or coated with protective coatings used in pickling.

ROUND BAR CENTERING

New tool for centering round bars preliminary to machining on centers has been placed on the market by the Whitcomb Manufacturing Co., Troy, New York. It removes centering operation from lathes and allows inexperienced operators to center bars quickly, easily and accurately. The machine will center round bars from ½" to 3" in diameter within .005".

NO. 7 OF A SERIES
HOW TUBE-TURN WELDING FITTINGS BENEFIT WAR INDUSTRY
The FIRST WELDING FITTINGS 1ST AND STILL THE BEST

Welding with TUBE-TURN fittings gives extra strength and trouble-free performance needed today to insure uninterrupted piping service



'ROUND the clock, war-time operation for 24 hours a day instead of the normal 8 hours period *triples* the wear of oil, gas, power, chemical, heating, air, refrigeration and marine piping today.

Despite the extra strain that fittings naturally take, coupled with constant three-shift operation, Tube-Turn welding fittings are *practical insurance* against piping failures. Tube-Turn fittings are *stronger and safer* because of their exclusive construction advantages. They provide leakproof, trouble-free joints that last as long as the pipe itself. They can be installed faster and easier, can be quickly insulated, instantly eliminate maintenance worries, and provide streamlined, space-saving layouts.

Sizes, types and weights are available for every industrial requirement. *Write for catalog and data book No. 111.*

OTHER IMPORTANT WAR-TIME ADVANTAGES:

SPEED INSTALLATION: Less time needed for aligning, thanks to true circularity and uniform walls. Only simple butt welds required, easy even for novice welders. Whole sections can be preassembled on the ground.

SAVES CRITICAL MATERIAL: Absence of many flanges, bolts, nuts and heavy cast steel construction saves many tons of metal in a single piping system.

LAST LONGER: Smooth inner walls—with no ridges, waves or scale—means less corrosion and longer life.

LESS PRESSURE LOSS: Because of full effective radius and exact O.D. and I.D. alignment with the pipe, the flow is more efficient and pressure loss is less.

FEWER SUPPORTS NEEDED: Since welded piping weighs less and stands vibration better than flanged systems, few hangers or supports are required.

TUBE-TURN

TRADE MARK

Welding Fittings and Flanges

TUBE TURNS (Inc.), Louisville, Ky. *Branch offices:* New York, Chicago, Philadelphia, Pittsburgh, Cleveland, Dayton, Washington, D. C., Houston, Los Angeles. *Distributors in principal cities.*

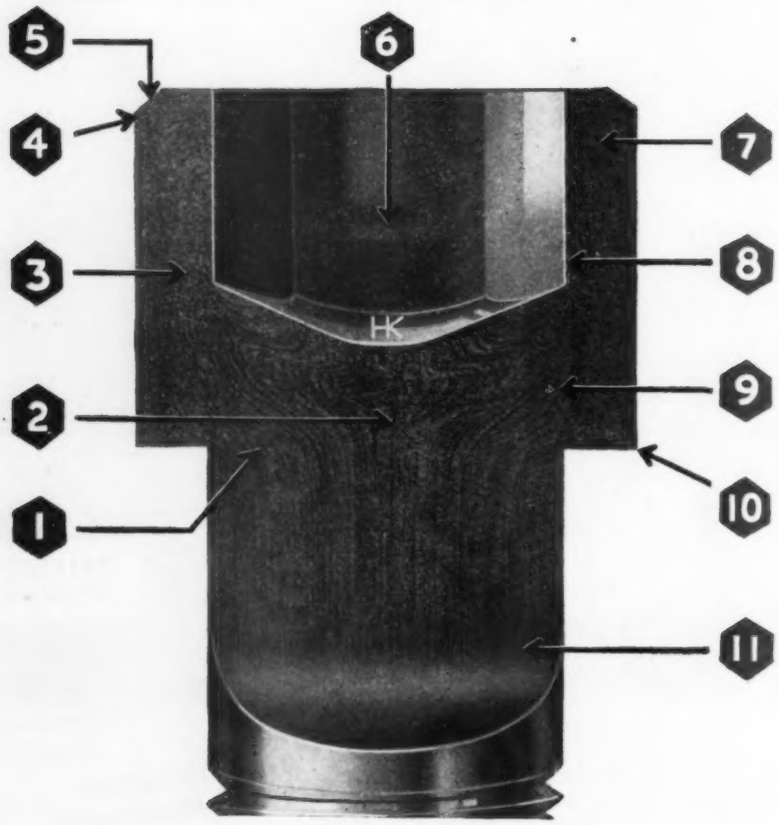
Winner of Army-Navy, Maritime Commission, Victory Fleet and Treasury Dept. awards.

BUY MORE BONDS!

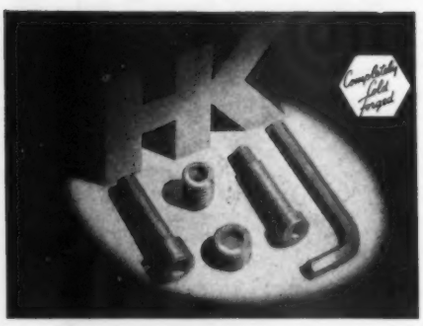
That EXTRA something!

Completely Cold Forged

by HOLO-KROME



HOLO-KROME FIBRO FORGED SOCKET SCREWS



The results of a superior method patented and used solely by HOLO-KROME in the manufacture of these precision made Completely Cold Forged Screws. . . . The 11 FEATURES shown are a few of the many "extra" qualities made possible by this exclusively Holo-Krome method. Our Catalog explains in detail. Have you a copy?

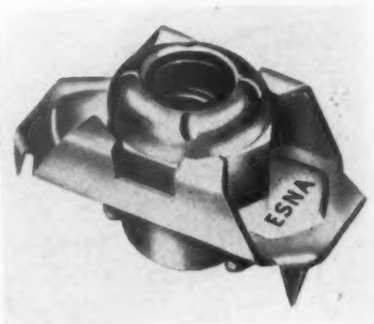
THE HOLO-KROME SCREW CORP., HARTFORD, CONN., U.S.A.

(*Continued from page* 110)

CHIP BREAKER GRINDER

New carbide tool chip breaker grinder with greater flexibility and higher capacity is announced by Carboloy Co., Inc., Detroit 32, Mich. The new grinder is designed for grinding of chip breakers in single point tools and roller turner turners. It can also be adapted to use for grinding flat form tools and round or square boring bits. Universal fixture and vise for holding tools up to 1¼" wide is provided with the machine. Base has storage space for tools, wheels, etc.

SELF-LOCKING STOP NUT

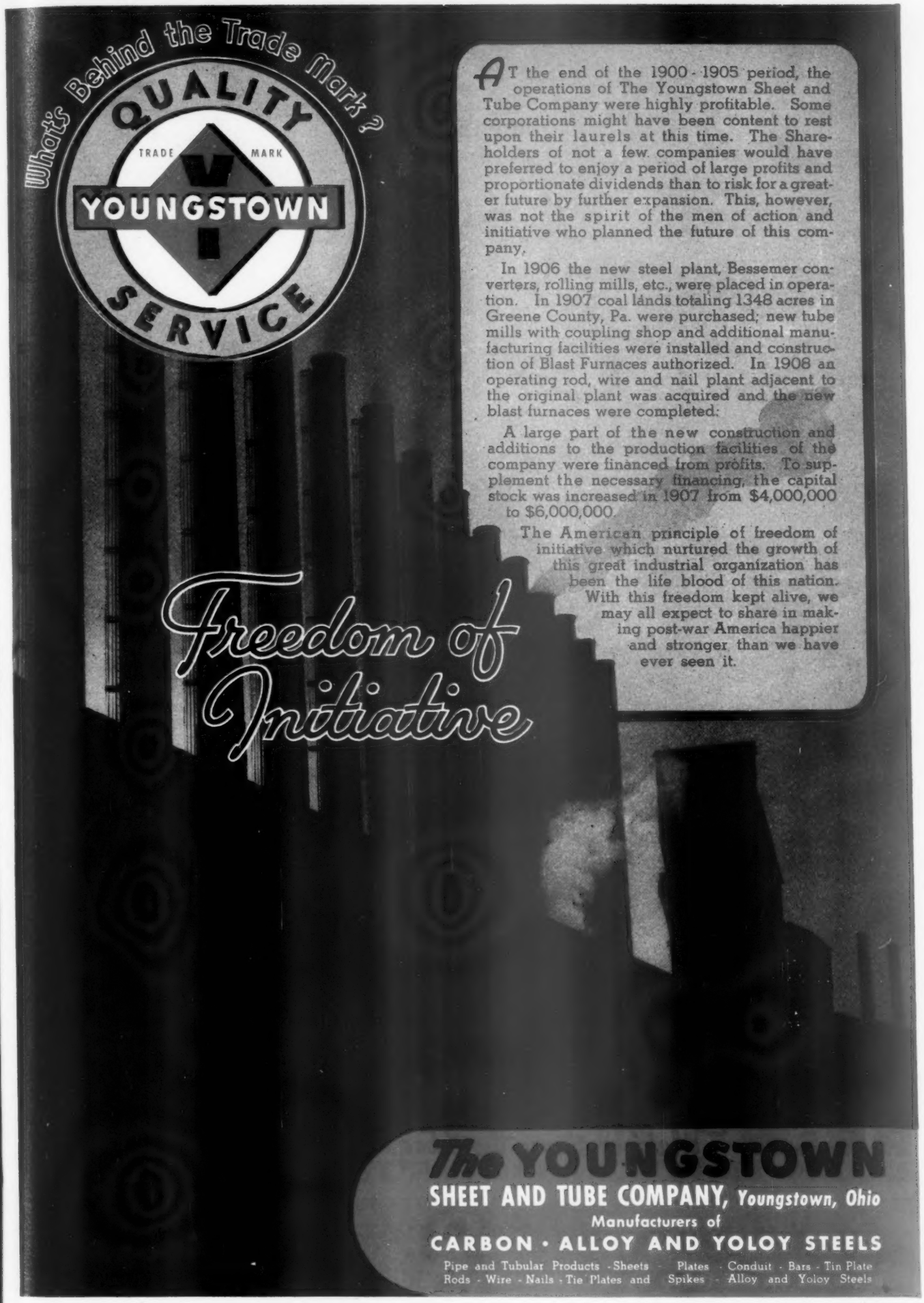


New self-locking device for use on plywood construction is announced by the Elastic Stop Nut Corp. of America. It has been tested and approved by the Army Air Corps. It can be installed from one side of the work, provides a washer surface, leaves outside of plywood surface smooth, does not twist in the hold, is replaceable in event of damage, strong against axial movement, independent of the thickness of the wood, and requires no special tool to affix. Nut can be installed in three easy ways—driven in with hammer, forced in with press, or drawn in with a bolt.

FLUORESCENT LAMP LOCK

Patented safety lamp lock is an integral part of each socket of new Aero-Designed fluorescent fixtures, according to The Miller Co., Meriden, Conn. The device minimizes the risk of lamps following from sockets. It is said to be fool-proof under all conditions, and to effect important savings in time and money. The device is simple in construction and is arranged so as not to interfere with fixture relamping and cleaning.

(*Continued on page* 116)


What's Behind the Trade Mark?
QUALITY
TRADE MARK
YOUNGSTOWN
SERVICE
Freedom of Initiative
AT the end of the 1900 - 1905 period, the operations of The Youngstown Sheet and Tube Company were highly profitable. Some corporations might have been content to rest upon their laurels at this time. The Shareholders of not a few companies would have preferred to enjoy a period of large profits and proportionate dividends than to risk for a greater future by further expansion. This, however, was not the spirit of the men of action and initiative who planned the future of this company.
In 1906 the new steel plant, Bessemer converters, rolling mills, etc., were placed in operation. In 1907 coal lands totaling 1348 acres in Greene County, Pa. were purchased; new tube mills with coupling shop and additional manufacturing facilities were installed and construction of Blast Furnaces authorized. In 1908 an operating rod, wire and nail plant adjacent to the original plant was acquired and the new blast furnaces were completed.
A large part of the new construction and additions to the production facilities of the company were financed from profits. To supplement the necessary financing, the capital stock was increased in 1907 from $4,000,000 to $6,000,000.
The American principle of freedom of initiative which nurtured the growth of this great industrial organization has been the life blood of this nation. With this freedom kept alive, we may all expect to share in making post-war America happier and stronger than we have ever seen it.
The YOUNGSTOWN
SHEET AND TUBE COMPANY, Youngstown, Ohio
Manufacturers of
CARBON · ALLOY AND YOLOY STEELS
Pipe and Tubular Products - Sheets - Plates - Conduit - Bars - Tin Plate
Rods - Wire - Nails - Tie Plates and Spikes - Alloy and Yoloy Steels

THE SUB-BUSTER THAT WASN'T THERE

"We didn't have a chance. That murderous Nazi's fire whiplashed our open boat. Helpless, we ducked, and those who could, rowed on. Out in a ghostly glare, our ship went down.

" 'By God, we'll make them pay for this,' said First Mate Stone, clenching his fist. Just then, a bullet got him in the throat.

"Your mind plays funny tricks at times like that. As those devils strafed us bow to stern, I seemed to see a DE Ship lunging in to pay them back a bit. Whenever I looked close, it wasn't there, and I kept wondering why."

* * *

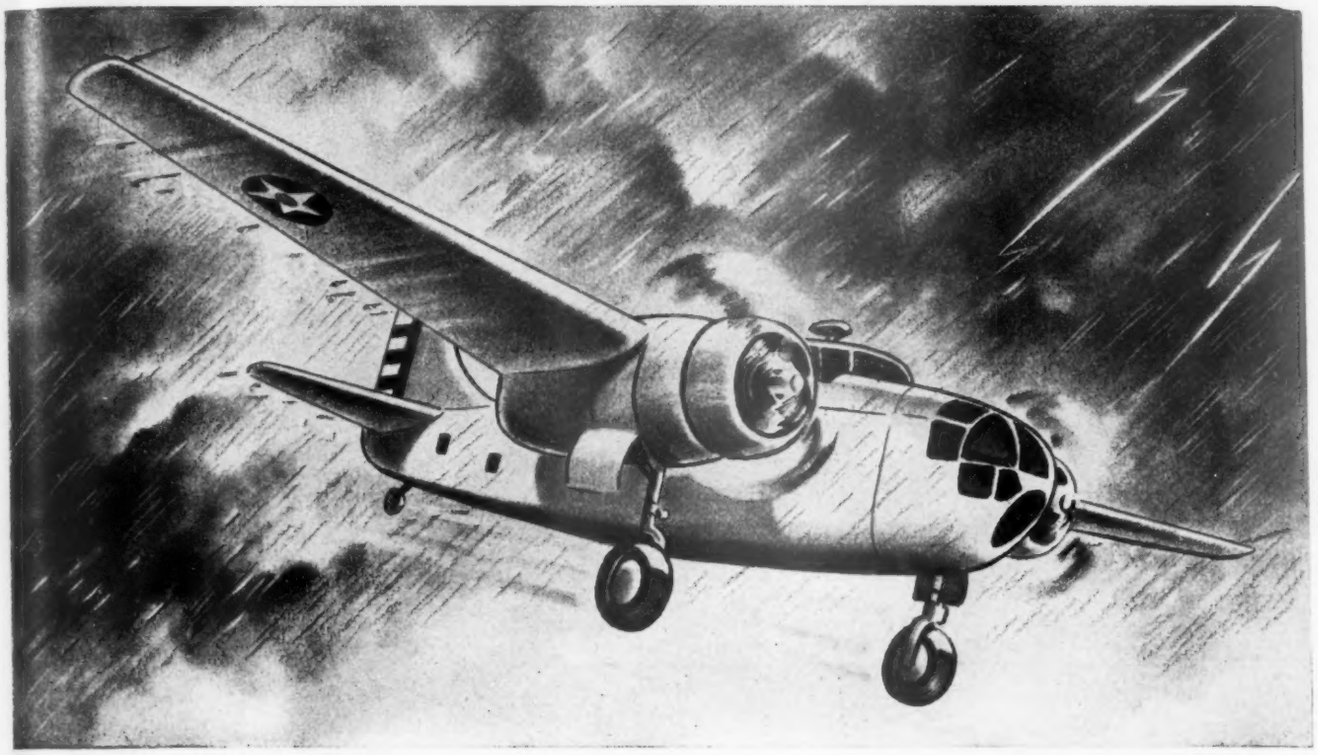
Thousands of tiny parts make ships, planes, tanks, trucks, guns. In many cases, men's lives depend on *when* and *how* those parts are made.

Here, at R B & W, making millions of bolts and nuts every day, we have pledged ourselves to the realization that every part, even the smallest, counts. To special bolt-and-nut-making processes insuring flawless strength and accurate fit . . . we are adding, each one of us, the personal care and extra effort needed for world-wide victory.

Perhaps the workers in your plant would benefit from a clearer idea of what our soldiers and sailors are enduring. How important *each* one's part is . . . is the basic theme of a series of posters based on ads like this one—posters freely available to every "bits and parts" manufacturer. Write us. Russell, Burdsall & Ward Bolt and Nut Company, Port Chester, N. Y.

RB&W *Making strong the things that make America strong*

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY



"THIS WON'T GET UNDER MY SKIN!"

says the aluminum-protected plywood plane

A TRAINING plane doesn't mind how wet it gets—as long as the water doesn't get under the painted surfaces of wing and fuselage. For under-the-skin water can cause paint failure and raise the grain of the wood.

For that reason, many training plane manufacturers are using aluminum paint made of Permite aluminum paste or powder. Layer upon layer of overlapping aluminum flakes form an armor-like protective coating which moisture has great difficulty in penetrating. The results are shown in longer flying-life and better flying performance.

This is but one of many production applications of Permite Aluminum Finishes, including Ready-Mixed Aluminum Paints, where extra resistance to moisture, heat, fumes or oxidation is essential.

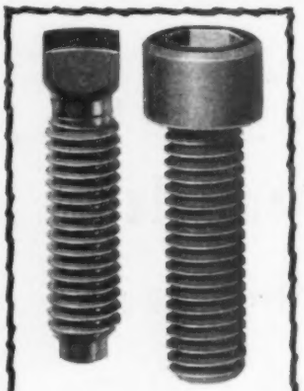
If you have finishing jobs requiring the special protective qualities of aluminum paint for wood or metal surfaces, write us for the latest rulings of the War Department on supplying aluminum paints for war production requirements.

ALUMINUM INDUSTRIES, INC., ... CINCINNATI, OHIO

PERMITE *READY-MIXED* **ALUMINUM PAINTS**

PERMITE *INDUSTRIAL* **FINISHES**

"CHICAGO" Means Precision!



CHICAGO "Safety Plus" PRODUCTS

★ Great Holding Power!

★ Made from Electric Furnace Steel!

★ Clean True Sockets!

★ Keys Fit Closely!

The quality demands of our Armed Forces are being met by "CHICAGO" Stock Products. Ease in assembly and strength and dependability are Front Line service requirements. Our plants are working day and night producing precision-made screw products essential to the Victory program.

Steel and Brass Hexagon Head Cap Screws, Case Hardened Square Head Set Screws, Flat Head Cap Screws, Steel Taper Pins, Steel Semi-Finished Castle and Steel and Brass Plain Nuts are just a part of the "CHICAGO" Stock Products line.

They're Hard!

They're Tough! They're Strong!

They're Accurate!

Order from your distributor

THE CHICAGO SCREW CO.

ESTABLISHED 1872

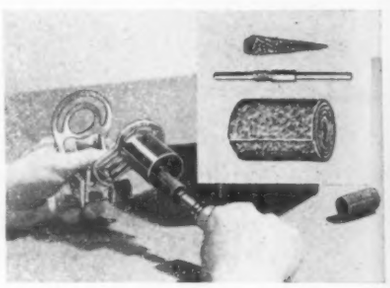
1026 SO. HOMAN AVENUE CHICAGO, ILL.

(Continued from page 112)

HIGH FREQUENCY HEATING

Almost any non-metallic material can be heated uniformly throughout and in minutes where it ordinarily takes hours, with Thermex High Frequency Heating Equipment, according to the Girdler Corp., Louisville, Ky. Heating is accomplished within the article or molecule itself by reason of its molecular resistance to high voltage, high frequency current passed through it. Equipment available in portable and stationary models, which are said to be highly efficient, flexible, and easy to operate, and applicable to wide range of products.

ABRASIVE WHEELS AND POINTS



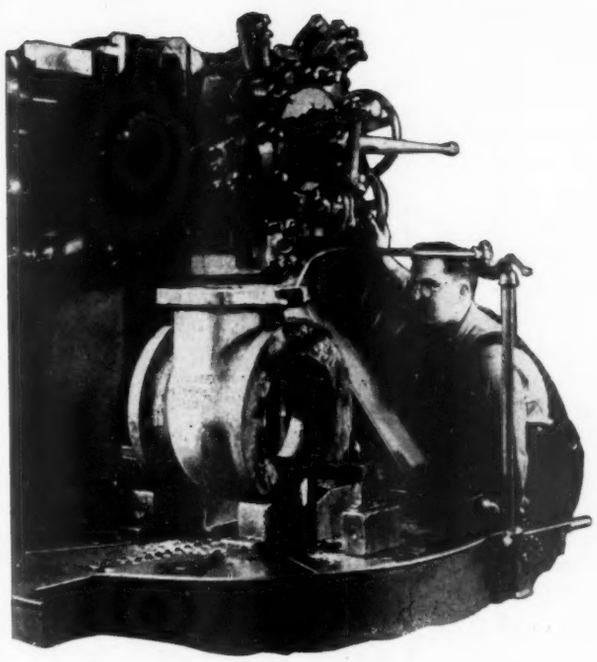
A new line of abrasive wheels and points with patented construction features that place a fresh abrasive surface constantly in contact with the work and allow full use of the spiral roll down to its final layers, is announced by the Flex-Abrasive Co., 100 No. La Salle St., Chicago. These abrasive wheels and micro-points are said to be especially suitable for hard to get at holes, openings and corners. They come in different types and sizes for use on alloy steels, rubber, wood, resin, and plastics. Mandrels are of tapered thread construction which firmly locks wheel or point to the shaft by its rotary motion.

ANNOUNCE WATERPROOF SHIPBOARD CABLE

NEW waterproof shipboard cable named Loxsteel is announced by Hazard Insulated Wire Works Divn. of the Okonite Co., Wilkes-Barre, Pa. It differs from previous designs only in the armor covering, and has a full interlocking metallic tape armor with smooth inner and outer surfaces and rounded arch. It has a double-packed seal designed to prevent moisture from entering the metal tape armor or junction boxes. Water-tightness is said to have been confirmed by tests conducted by the National Bureau of Standards. Can be bent without injury around a circle only six times the cable diameter.

(Continued on page 113)

Machining... IN THE WORLD'S LARGEST VALVE PLANT



GAZE down the aisles of this machine shop in the huge Crane Chicago Works! As far as the eye can see are vertical turret lathes—lathes that make possible the rapid machining of valves. The shorter set-up time—the speed at which they operate—mean fewer man-hours per valve—enable Crane to keep pace with war's demands for *quality* valves—produced in tremendous quantities.

Production has been doubled and redoubled at Crane Co. and today, in the plant of the world's largest maker of valves, acres of machines under the hands of skilled workmen are producing ever-increasing numbers of valves that are so vital to victory.

When the war is won, and peace returns to the world, Crane will be in a position to care for the needs of American industry without the delays and uncertainties attendant upon reconversion of plant and equipment. Crane will continue to furnish its usual *high quality* products—seasoned with the knowledge and the new techniques learned during the period of war.

CRANE CO., 836 South Michigan Ave., Chicago, Illinois

ARMY E NAVY

CRANE VALVES

(*Continued from page* 116)

RIGHT ANGLE IRONS

Universal right angle irons are announced by the Challenge Machinery Co., Grand Haven, Mich., as tools of many uses. They fit the job wherever square reference surfaces are needed. They may be placed in almost any position with the work clamped to the surface for measuring. Also may be used as height blocks for measuring large work. Ends and sides are precision ground, both square and true. Convenient hand grip is provided by the opening.

WHITE PENCIL TRACING CLOTH

Improved white pencil tracing cloth, named Whitex, is announced by the Frederick Post Co., Box 803, Chicago, Ill. It is moisture resistant on both sides, and has fine-tooth surface which makes for jet-black pencil lines. Whitex is said to have glass-like transparency. Samples can be secured for the asking.

INSERTING BRADS IN DIFFICULT CORNERS

Bradmaster is the name of a magnetic tool announced by the Markwell Mfg. Co., Inc., 200 Hudson St., New York, for driving brads in difficult corners. Company also has limited supply of metal carton openers with flat handle, 14½" long and 1⅜" wide, for easy opening of corrugated cartons, cutting cord, twine, rope, etc.

NEW WELDING LENS

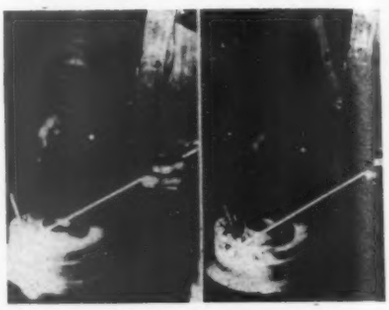


Illustration compares the efficiency of a standard welding lens and a new one developed by American Optical Co., Southbridge, Mass. Picture at left was taken through standard lens, the rod and bead being obscured. Picture at right illustrates how welding goggles fitted with Noviweld-Didymium lenses enable flame-welder to see the rod and working area more closely, making for greater efficiency, protection and comfort.

NEW INDUSTRIAL RECTIFIER

New models known as the "M" series Rectodyne, available in various capacities ranging up to 1500 watts, are announced by the McColpin Christie Corp., Ltd., 4920 So. Figueroa St., Los Angeles 37, California. These are designed primarily for military agencies, aircraft companies and industrial plants desiring a rectifier of medium capacity. A total of 24 new models is offered. In addition to the stationary model illustrated, a portable model mounted on 8" rubber-tired wheels, with convenient handle, is available.

(*Continued on page* 120)

Start with the BEARINGS

SLEEVE TYPE BEARINGS
Any Size
Any Type
Any Quantity

• Practically every day we read that a new record of performance has been established. One day it's a plane . . . setting a new mark for speed . . . or altitude . . . or distance. The next day it's a machine tool . . . providing longer hours of operation . . . with greater loads and speeds. These records are possible only when the motive unit operates with the highest degree of efficiency.

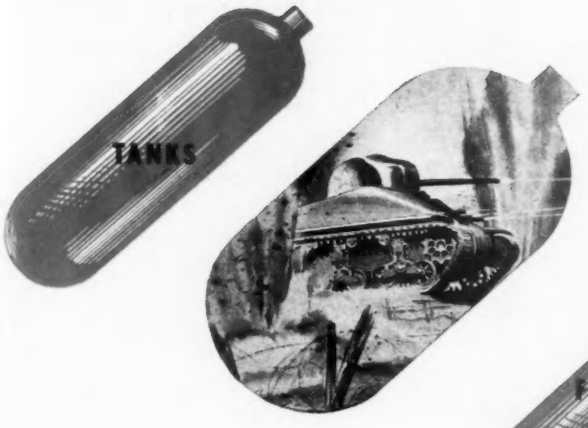
Before any motive unit can operate efficiently it must be equipped with the *correct* type of bearing for each application. That's where we come in. For more than thirty-five years we have helped manufacturers of all types of equipment select the bearing that will deliver the greatest performance.

At the present, all of our manufacturing facilities are engaged in the production of sleeve bearings for armament. But our advice and counsel is available. Simply write us and a Johnson sales engineer will call on you . . . at your convenience.

JOHNSON SLEEVE BEARING 450 S. MILL STREET
The MOST COMPLETE SLEEVE BEARING SERVICE in the WORLD
BRONZE HEADQUARTERS NEW CASTLE, PA.

HIGH PRESSURE GASES

have many war jobs to do . . .



and Kidde makes the right container for each of them

★ Today there is far greater use for high pressure gases than ever before. Kidde has kept pace with this development by providing containers in an ever-widening variety of shapes and sizes. Special purpose valves and release mechanisms have been devised by Kidde engineers for proper application of the gases.

Kidde cylinders are used for storing liquefied carbon dioxide and hydraulic fluids under pressure, for oxygen, nitrogen, helium and other gases.

If *you* need help in solving a high pressure container problem, write us telling us about your requirements. Let us work with you to develop the right container for your particular needs. Walter Kidde & Company, Inc., 846 Main St., Belleville, N. J.

Kidde PROTECTS LIVES

HIGH PRESSURE GASES • FIRE PROTECTION

PROTECTION—1943 STYLE

Designers of war equipment learned a lot from World War I. From the standpoint of protection, there is no comparison between the modern helmet of today and what the doughboys wore in '17.

Packing design, too, has taken great strides in meeting the new requirements of World War II.

The General All-Bound, for instance, is giving maximum safety to a wide range of vital supplies. Made of selected woods, this engineered box is wire stitched and bound. Consequently, it provides the strength of steel on all six surfaces. Assembly is quick and easy . . . as it comes in one piece. No nails are required. The sure, firm closure gives maximum safety. The Rock Fasteners (loop closures) are opened quickly and easily when the shipment reaches destination. No vital minutes are lost.

Why not see if General Boxes can give your war shipments the extra safety and speed that wartime requirements demand? General Box engineers have solved countless shipping problems for manufacturers in many industries. Their extensive war experience has equipped them to help you meet your government packing specifications. Write today.

For manufacturers of war products: General Heavy Duty Wire-Bound and Nailed Wooden BOXES and CRATES

Where availability of materials permits: Corrugated BOXES and Wood Cleated Fibreboard CONTAINERS, Generalite and Nailed Strapped BEVERAGE CASES for Domestic Service

GENERAL BOX COMPANY

GENERAL OFFICES: 48 West Illinois St., Chicago, Illinois
DISTRICT OFFICES AND PLANTS: Brooklyn, Cincinnati, Detroit, East St. Louis, Kansas City, Louisville, Milwaukee, New Orleans, Sheboygan, Winchendon; Continental Box Company, Inc.: Houston, Dallas.

(*Continued from page* 118)

addition to the stationary model illustrated, a portable model mounted on 8" rubber-tired wheels, with convenient handle, is available.

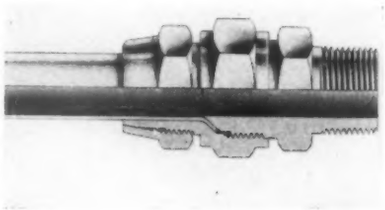
DIE PIERCING OF STAMPINGS

New type of punch press, known as automatic electric, has been developed by Dayton Rogers Mfg. Co., 2835 12th Ave. So., Minneapolis, Minn. With these presses it is possible to change the hole size and location of holes in a given group of pierced blanks to any size and location required. Hole sizes in the pierced blanks can be produced from .015" to 1⅛", progressing by .001. Presses come in two sizes, with throat capacity from 12" to 14" with maximum tonnage of 15 tons.

HIGH SPEED METAL SAW

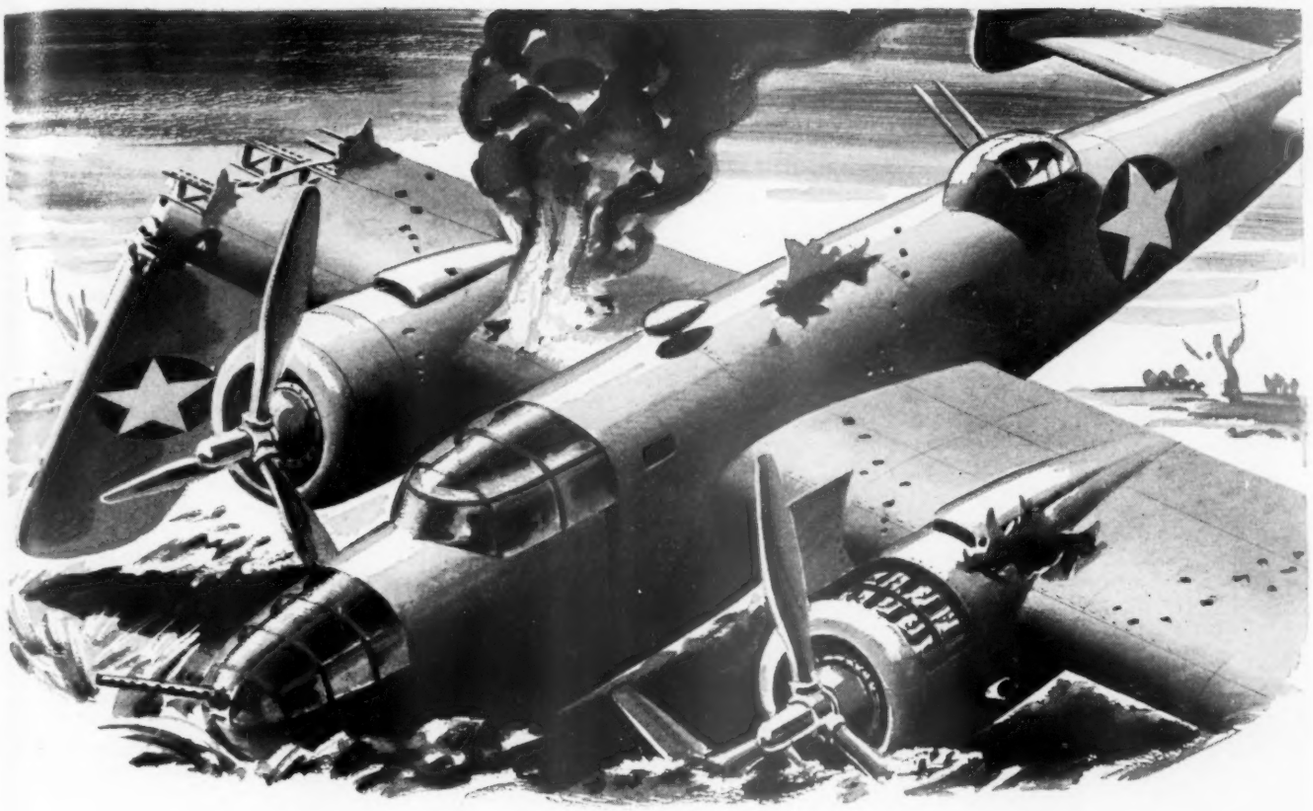
New high speed steel saw, is announced by E. C. Atkins & Co., Indianapolis, Ind. Saws are made .062" on tooth edge x .052" at mandrel. Each tooth has a relief clearance ground at the back to the depth of the gullet, which allows for sufficient clearance where tolerance as close as .0002" must be maintained. Especially adapted for sawing ferrous and nonferrous metals where accuracy is a first requirement. Specifications are limited and in the following sizes only: 3", 4", 5", 6" and 8" diameters for most standard milling machines.

HYDRAULIC TUBE FITTINGS



New line of industrial and hydraulic tube fittings bearing the trade name "Collet Grip," is announced by The Cotner-Wilkinson Co., Logansport, Ind. Fittings provide safe, dependable connections without the necessity of threading, welding or soldering, according to the manufacturer. The double nut series (illustrated) is made in many models for tube sizes ranging from ¼" to 2". The design places the load on the tube, directing the pulling stresses and vibration strains away from the flare. There is also a single nut series simplified for close work.

(*Continued on page* 122)



Because of "Sabotage" in Your Shipping Room?

When the Stukas come over, the lack of one small repair part could keep a war plane grounded—could be the cause of a costly fighter plane being blitzed on its own air field without a chance to fight. Vital plane parts can be smashed in shipment—sabotaged by Defective Packing.

Destroy that sneaking saboteur, Defective Packing! Keep him *out* of your shipping room by standardizing *now* on safe, effective KIMPAK* for all packing protection. Whatever you manufacture, the wide variety of KIMPAK types provides *exactly* the combination of softness, resiliency, surface protection and moisture *resistance* or moisture *absorption* which your particular packing problem demands. KIMPAK is a versatile material. It protects against breakage, chipping, scratching, "burns", water damage, liquid leakage and other shipping hazards. And in all its forms, it is *always* clean, non-corrosive and 100% free of abrasive foreign material.

Whether you produce the tiniest test tubes or the toughest tank parts, it will profit you to find out more about the extraordinary economy and safety of KIMPAK protection. There's no obligation—mail the coupon today.

PACK WITH

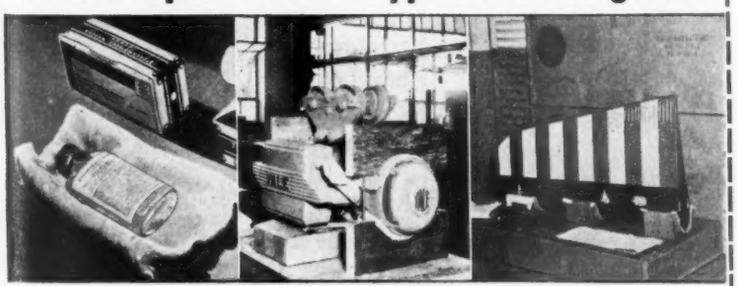
Kimpak

REG. U.S. PAT. OFF. & FOREIGN COUNTRIES

CREPED WADDING

*KIMPAK (*trade mark*) means Kimberly-Clark Wadding*

KIMPAK protects all types of war goods



Some KIMPAK can absorb 16 times its weight in liquid.

Heavy machines are protected in transit by KIMPAK pads.

KIMPAK provides shipping protection for various plane parts.

KIMBERLY-CLARK CORPORATION
Established 1872 P-843
Creped Wadding Division, Neenah, Wisconsin

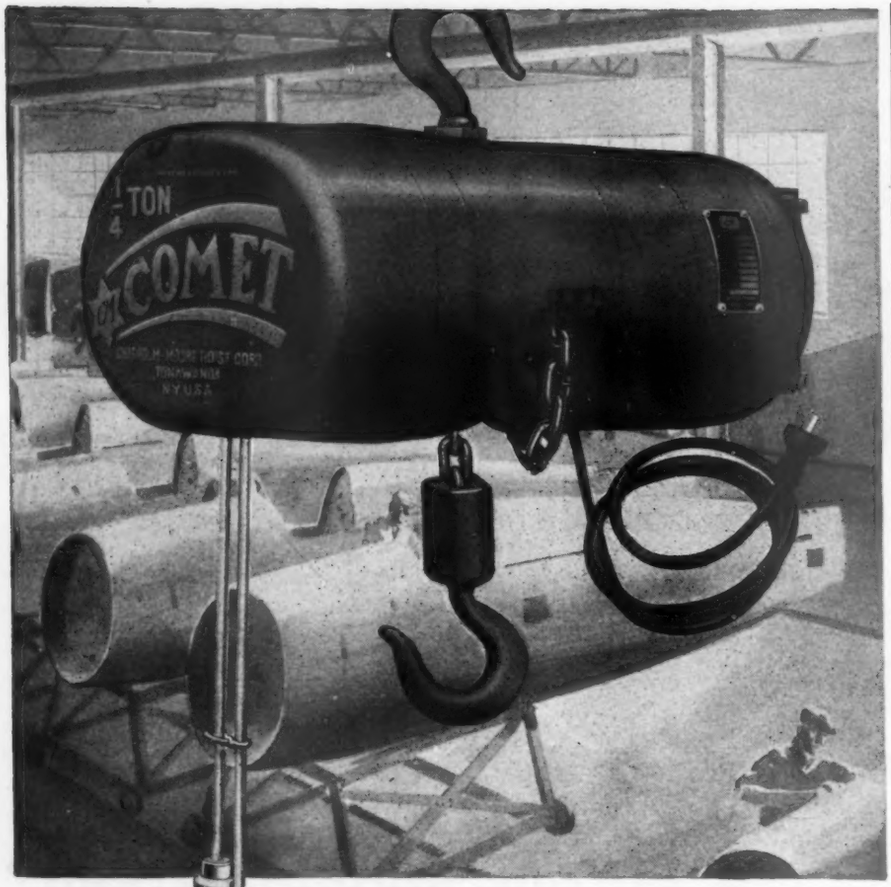
Send more information on packing with KIMPAK for safety and economy.

Name .....

Company .....

Address .....

City ..... *State* .....



LIFTING
War Planes on faster schedules

The CM Comet Electric Hoist is helping aircraft and other war industries set faster production schedules through efficient materials handling in practically all stores, fabrication and assembly departments. Durable and fast, the CM Comet is being used on trolleys, monorails, cranes and as a portable unit. *Efficiently operated by new personnel.* The versatile, low-cost, CM Comet will speed-up your production schedules. Write for illustrated engineering catalog No. 138.

CM COMET

★ ★ ★

INVEST REGULARLY IN VICTORY—BUY WAR BONDS AND STAMPS

★ ★ ★

CHISHOLM-MOORE HOIST CORPORATION
(Division of Columbus-McKinnon Chain Corp.)
120 FREMONT AVENUE, TONAWANDA, NEW YORK
BRANCH OFFICES: NEW YORK • CHICAGO • CLEVELAND

(*Continued from page* 120)

NEW D-C VERTICAL MOTORS

New line of direct current vertical motors ranging from 40 to 200 hp at 1750 rpm, and in equivalent ratings at other speeds, is announced by the General Electric Co. The new motors, which are furnished with both constant and adjustable speeds, are designed for low-thrust solid-shaft applications on pumps, machine tools, and marine underdeck auxiliaries. They are appropriate where valuable floor space must be saved or the expense of gearing avoided.

SOMETHING NEW IN SCREWS

Clutch Head Screws are operative with an assembly bit or with a standard type screwdriver. They are a new development in the recessed head category, announced by United Screw & Bolt Corp., Chicago.. They make for quick and easy access to assembled units anywhere at anytime. On assembly lines, the screws are said to offer the advantage of speed, economy and elimination of driver slippage. May be removed or tightened with driver at an angle of 45°. Clutch Head screws are available in wide range of head designs, and with thread-forming feature.

ASBESTOS CEMENT LOCKER SHEATHING

THE Philip Carey Mfg. Co., Cincinnati, Ohio, announce that durable, highly efficient lockers are now being made with Careystone (asbestos-cement) flat sheathing. The material is made of cement and asbestos fibres and will not rust, rot or corrode, and is fire and rodent proof. Material is available in sheets 48″ x 96″, and 3/8″ thickness is recommended for building lockers. Material can be handled by plant carpenters or maintenance men.

WELDING POSITIONER 500 LBS. CAPACITY

DESIGNED to handle loads up to 500 lbs. with the center of gravity of load 6″ away from the table top and with a 6″ eccentricity, new 500 lb. capacity welding positioner introduced by the Ransome Machinery Co., Dunellen, N. J., is available in hand or motor operated models. The positioner is said to be particularly suited to work ordinarily han-

(*Continued on page* 126)

WHEN YOU WANT TO KNOW ABOUT STAINLESS...

Every man who works with Stainless Steel needs a copy of the *Handbook* compiled by the Rustless Iron and Steel Corporation.

It is the *end-product* of the vast experience of the only company in the United States, all of whose facilities are devoted exclusively to making Stainless Steel.

In pictures, charts, graphs and photo-micrographs . . . in clear, explicit words . . . it tells what Stainless Steel will, and will not accomplish. It is your guidebook on *when, where, how* and *why* to use the various types of Stainless. A copy will be sent to you on request.

Rustless Service does not stop with placing this book in your hands. Every order we receive from you is checked and rechecked by men who (like all Rustless personnel) are specialists on the applications of Stainless Steel. They will help you to avoid ordering the wrong type of Stainless Steel.

IF IT'S URGENT,
ASK RUSTLESS BY PHONE.
CALL WOLFE 5400, BALTIMORE, MD.

Producing STAINLESS STEEL *Exclusively*

RUSTLESS
CORROSION AND HEAT-RESISTING
STAINLESS STEELS

RUSTLESS IRON AND STEEL CORPORATION, BALTIMORE, MARYLAND

SALES OFFICES: BUFFALO • CHICAGO • CINCINNATI • CLEVELAND • DETROIT • LOS ANGELES • NEW YORK • PHILADELPHIA • DISTRIBUTORS IN PRINCIPAL CITIES

LOOK WHAT'S HAPPENED TO

SINCE G-E MADE THIS ANNOUNCEMENT

FACTS YOU SHOULD KNOW ABOUT NON-METALLIC REFLECTORS *for Fluorescent Fixtures!*

EFFICIENT NEW REFLECTORS RELEASE TONS OF STEEL FOR OTHER WAR PRODUCTION

INTENSIVE work by the lighting industry now has developed non-metallic reflectors for fluorescent lamp fixtures. They are efficient, light in weight and built to stand up under hard usage in industry.

No more steel reflectors may be manufactured except for dust-tight and vapor-proof units. Realizing the need to conserve metal, lighting engineers have been working for almost a year to find alternate reflector materials. They have succeeded. General Electric is proud to have been able to contribute to the research that has made these efficient new reflectors possible.

There have been, of course, many experiments with non-metallic reflectors. To make certain that the reflectors on the fixtures you get will give uniformly satisfactory service . . . that they will be strong and durable . . . you will find it advisable to buy tested and certified fixtures. Look for the Fleur-O-Lier or RLM label!

General Electric ran this announcement in electrical magazines in January 1943, showing sample fluorescent fixtures made to comply with WPB restrictions on metals.

FLEUR-O-LIER
"SPECIFICATIONS FOR LUMINAIRES, FITTINGS AND AUXILIARIES FOR FLUORESCENT LAMPS"
ELECTRICAL TESTING LABORATORIES

Fluorescent fixtures bearing either of these two labels are made to rigid specifications for mechanical, electrical, and illuminating excellence; and are tested and certified by impartial experts, Electrical Testing Laboratories, Inc. of New York. You can depend on fixtures bearing these labels.

Hear the General Electric radio programs: "The Hour of Charm", Sunday, 10:00 p.m., E.W.T., NBC; "The World Today", News, each weekday, 6:45 p.m. E.W.T., CBS.

BUY WAR BONDS!

G-E MAZDA LAMPS

GENERAL ELECTRIC

FLUORESCENT LIGHTING . . .

RESTRICTIONS which WPB has established on the use of metals in fluorescent fixtures have been a challenge to the lighting industry. A challenge which the industry was more than ready to meet, but which presented almost insurmountable difficulties—coming as it did along with an acute shortage of lighting equipment for important war plants.

Long before the first WPB order, General Electric engineers had been working with fixture manufacturers to develop new fixtures using a minimum of critical materials. Last January, G-E announced that several types of non-metallic reflectors had been developed. Today, thanks to the ingenuity of the fixture manufacturers, a large selection of certified fluorescent fixtures, complying with WPB requirements and meeting the lighting industry's rigid specifications, are now available on priorities for war plants that need them.

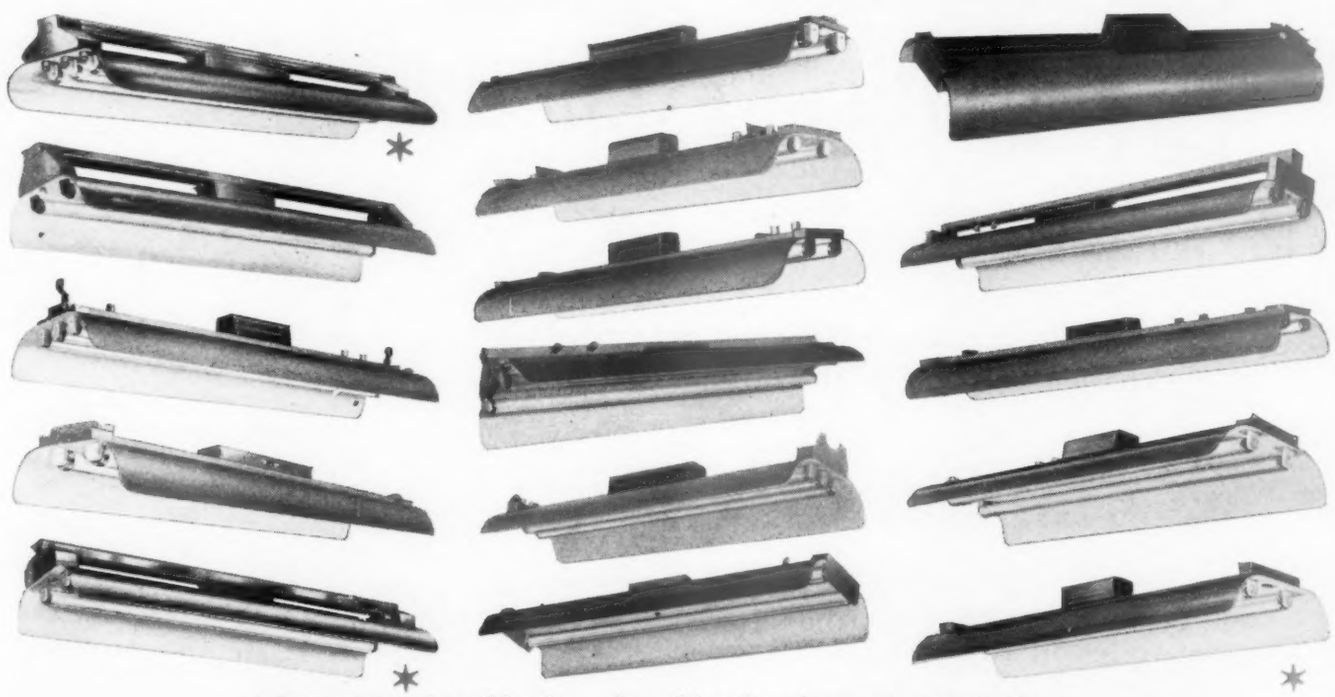
General Electric is proud of its share in this achievement—and G-E research will continue to work with fixture manufacturers toward making better and better lighting fixtures—for the duration and afterwards.

Now... CERTIFIED FIXTURES ARE AVAILABLE FROM MANY MANUFACTURERS

LIGHT—STURDY CONSTRUCTION . . . FOR CONTINUOUS ROW OR INDIVIDUAL MOUNTING . . . 2 OR 3-LAMP TYPES IN 40-WATT SIZE—2-LAMP 100-WATT SIZE

Here are a few of the many different types of certified fluorescent fixtures available from the 50 Fleur-O-Lier and RLM Manufacturers through their wholesalers. All comply with WPB conservation orders and are made by manufacturers of ETL certified equipment. (*Names of these manufacturers on request.*)

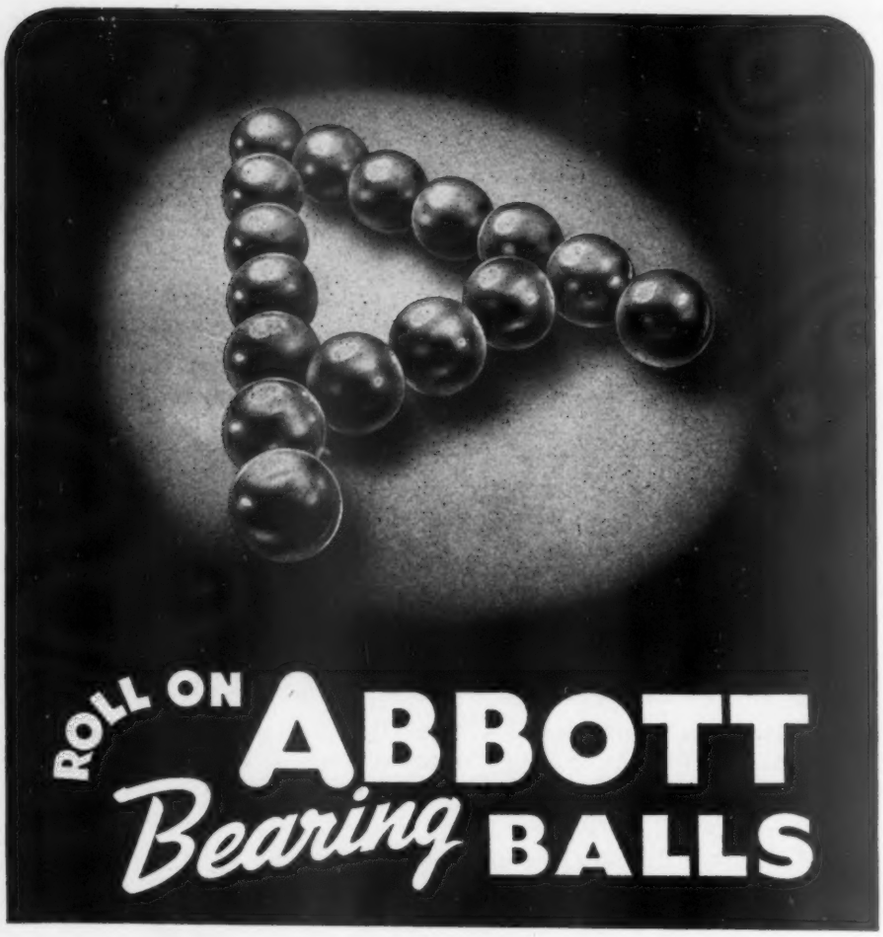
General Electric does not make lighting fixtures but is glad to recommend certified fluorescent fixtures.



✶ *In process of certification when this advertisement goes to press.*

G-E MAZDA LAMPS

GENERAL ELECTRIC



LIFE IS INCREASED!

Yes, your product assemblies have longer life—uninterrupted producing value with ABBOTT BEARING BALLS on the job. Daily applications prove this.

With Bearing Balls, it's stamina on the job that produces the results today. In light or heavy mechanisms ABBOTT is fulfilling the desired requirements and more.

STAMINA is Vital

Add that "something extra" to your product assemblies and give them the stamina so vital in furthering the war effort — specify ABBOTT.

DELIVERY? Just tell us your requirements and we'll let you know what we can do. We will match your Standards of Precision with the proper grade of ABBOTT BALL.

ROLL ON ABBOTT *Bearing* BALLS
THE ABBOTT BALL COMPANY HARTFORD, CONN. U.S.A.

(*Continued from page* 122)

dled by women welders. The 26" diameter circular table top is T-slotted. Tilting range is a full 135° from horizontal or 45° beyond vertical providing the "down under" position for all downhand welds.

BRONZE FLANGES FOR SILVER BRAZING

BRONZE flanges for silver brazing equipped with preinserted alloy rings, available in both plain and bulkhead types, undrilled and spot faced, are announced by the Barnes Manufacturing Co., 660 No. Main St., Mansfield, Ohio. The flanges come in 100, 200 and 500 pound pressure requirements, and conform to U. S. Navy Specification 45F 14 (INT) of Dec. 1, 1941. They are also available in any size for 150 pound pressure required for Merchant Marine and Commercial Service.

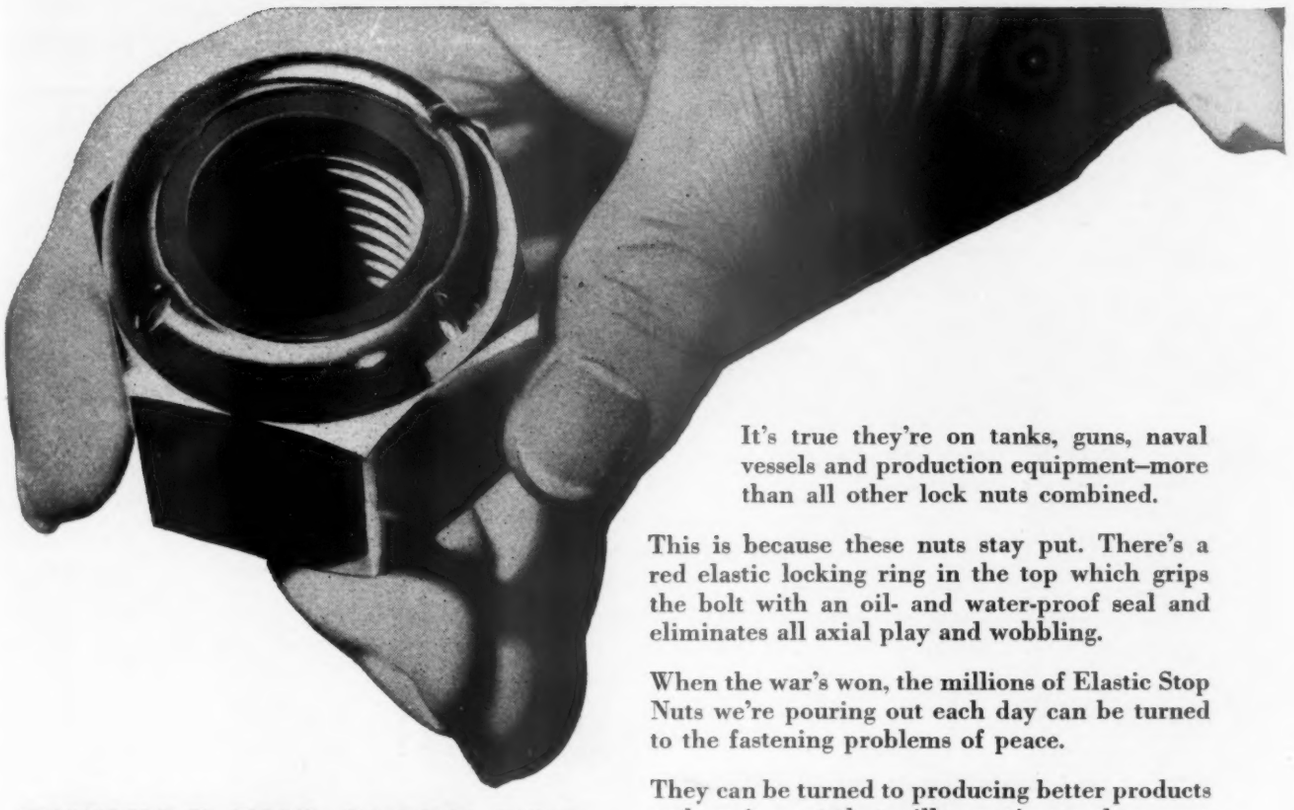
DIAMOND DRESSING TOOL

NEW diamond dressing tool that fits most standard grinding machines known as "Kodi", has been introduced by the Koebel Diamond Tool Co., 9456 Grinnel, Detroit, Mich. It is said to do away with the necessity of a special dresser for each machine. Graduations placed in a developed sequence to guide the operator are a feature of the tool. Longer wheel life and greater grinding efficiency are said to result from the fact that diamonds turned frequently insure constant sharp points.

INSTRUMENT FOR MEASURING GLOSS

NEW gloss meter, styled Goniophotometer, which measures high, medium and low gloss, from zero to 100% of plane surfaces of materials over 2 1/8x3 inches in size, such as paint finishes, enamels, lacquers, metals, wood, paper, plastics, glass, etc., is announced by the American Instrument Co., Silver Springs, Md. Kinds of gloss measured with this instrument are specular gloss, contrast gloss, distinctness-of-image gloss, absence-of-bloom gloss, and other optical properties of surfaces of all kinds. Complete description is given in Bulletin CF 2115.

(*Continued on page* 128)



THEY'RE THE NUTS FOR POSTWAR PLANNING

IT'S true that now we can't supply all the Elastic Stop Nuts Uncle Sam wants – even with three big plants running 24 hours a day.

It's true that Elastic Stop Nuts are flying in every American plane – sometimes 50,000 of them in a single ship.

It's true they're on tanks, guns, naval vessels and production equipment–more than all other lock nuts combined.

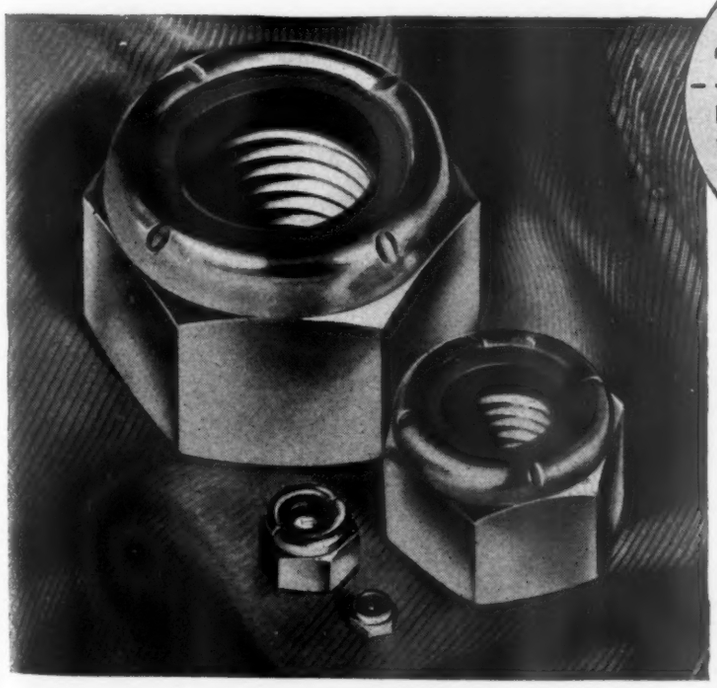
This is because these nuts stay put. There's a red elastic locking ring in the top which grips the bolt with an oil- and water-proof seal and eliminates all axial play and wobbling.

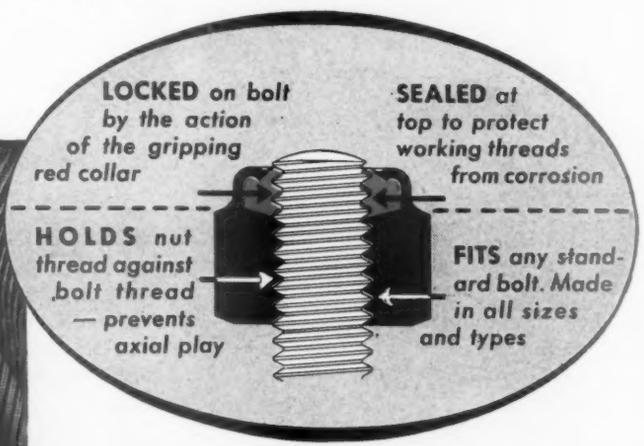
When the war's won, the millions of Elastic Stop Nuts we're pouring out each day can be turned to the fastening problems of peace.

They can be turned to producing better products and equipment that will save time and expense for maintenance engineers.

Whatever your fastening problems might be, our engineers, experienced in the work of both war and peace, will be glad to help cope with them.

Feel free to call upon them. They'll work with you and suggest the proper Elastic Stop Nut to lick the job.




LOCKED on bolt by the action of the gripping red collar
SEALED at top to protect working threads from corrosion
HOLDS nut thread against bolt thread — prevents axial play
FITS any standard bolt. Made in all sizes and types

ELASTIC STOP NUTS

Lock fast to make things last

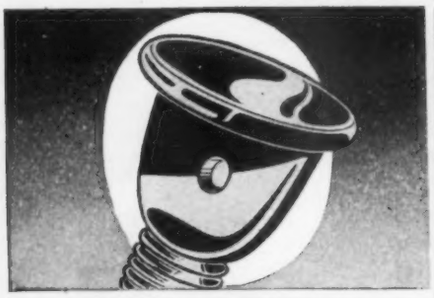
ESNA TRADE MARK

ELASTIC STOP NUT CORPORATION OF AMERICA
Union, New Jersey and Lincoln, Nebraska

It's manhours at work that adds up to top production; not the number of men so much as the time spent in actual productive effort. Reduce not only fatigue but time out . . . have constant, refreshingly cool drinking water conveniently placed. And above all, make sure of sanitation—use Halsey Taylor health-safe coolers and drinking fountains. Types for office or plant . . . pedestal, wall or battery! Write!

THE HALSEY W. TAYLOR CO.
WARREN, OHIO

HALSEY TAYLOR
AUTOMATIC STREAM CONTROL • TWO-STREAM PROJECTOR
DRINKING FOUNTAINS



A SPECIAL HEAD

was required to design this job in the way we did it. We had to have precision and uniformity and, at the same time, use a minimum of material. It is a good job — serves its purpose perfectly. The same heads which handled this production problem are waiting to go to work for you, if you want machine screws — or fastenings in standard or special design and all types of heads. Also plastic insets and similar items.

If you haven't our catalog — please write for it.

NEW ENGLAND SCREW CO.
KEENE, NEW HAMPSHIRE
INCORPORATED 1892

Double Protection against DERMATITIS

Neoprene Stanzoils keep hands safe from outside harm—and from allergy to rubber gloves

Stanzoils of DuPont neoprene withstand attack of oils, acids, caustics so well they often last 3 to 7 times as long as rubber gloves — which gives you the best possible hand protection as well as expense saving. But also, neoprene Stanzoils do not cause dermatitis of the hands as rubber gloves do in some cases. It pays you to give your war-busy hands the double safety of Stanzoils — black, white, all standard styles and sizes. Write today for full data.

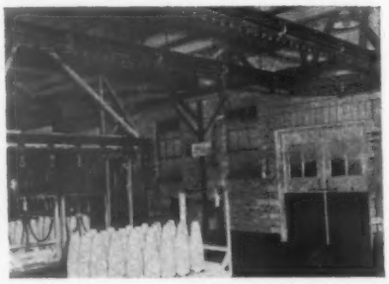
Synthetic Rubber Division
THE PIONEER RUBBER CO.
257 Tiffin Rd., Willard, O., U. S. A.
New York • Los Angeles

STANZOIL PIONEER

MADE WITH DU PONT NEOPRENE

(Continued from page 126)

TRUCK TOWING CONVEYOR

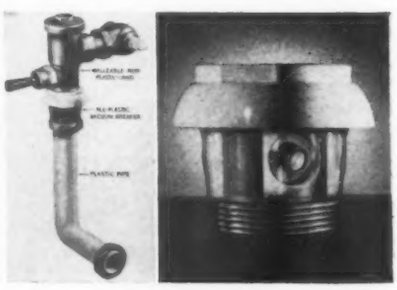


Systems illustrated are designed to tow trucks loaded with any type of commodity through sub-assembly and final assembly. Towing hooks are easily detached by hand or automatically at any pre-determined location. Conveyor at lower elevation is equipped with swivel hooks for conveying parts through automatic spray painting machines and drying ovens. Parts are mechanically turned during painting process. The Alvey-Ferguson Co., Cincinnati, Ohio.

SEALS LEAKS AGAINST PRESSURE

FLEXTITE is announced by the Flexrock Co., 23rd & Manning Sts., Philadelphia, Pa., for sealing leaks in walls, tanks, vats, pits, basements, etc. It comes in liquid form and when added to concrete mortar sets up quickly. It can be also used for waterproofing walls. Keeps water in as well as out, and can be used for sealing concrete tanks or vats in which water must be stored.

VICTORY FLUSH VALVE



"VICTORY" type flush valve has been developed by the Sloan Valve Co., Chicago, Ill. Copper content has been reduced from approximately 6 lbs. in standard model, to less than 4 oz. per valve. Tests demonstrated that new valve will give service equal to 10 years' normal wear without need for repair or adjustment. Valve body is of malleable iron with plastic sleeve as lining. Piston also is of plastic. Vacuum breaker is an all-plastic unit. This breaker has transparent outer-shell which permits visual inspection of the flapper, a mechanical means for opening and closing the airport. Other plastic parts include the handle, elbow flush connection, handle plunger, auxiliary valve and bumper ferrules.

(Continued on page 130)

WE'RE HELPING *Wing the way* TO VICTORY

Over the world fly the winged armadas from America—that the air and earth and sea shall be free.

☆ ☆ ☆

To this winged victory, American Central employees give their strength, skills, resources.

☆ ☆ ☆

With the victory, American Central will about-face to Peace. We shall take up, not where we left off, but with broader facilities, deeper research, higher perfections in the manufacture of home-needed, world-needed equipment. As surely as you see the wings overhead, you shall see freedom and peace and plenty . . . in which "A-C" will take a productive part.

AMERICAN CENTRAL MANUFACTURING CORPORATION

AMERICAN CENTRAL
MANUFACTURING CORPORATION
CONNERSVILLE · INDIANA

Vital Links in modern Production

ALLIED MACHINE & ENGINEERING CORP.
NEW PHILADELPHIA, OHIO

FOR GENERAL SURFACE GRINDING
...The 846 K-1 Wheel Can't Be Beat!

That's the opinion not of one . . . nor a few . . . but of hundreds of production men in scores of plants throughout America. And there's a reason. It's one of those all too rare wheels that give:

1. Excellent Finish
2. Maximum Stock Removal
3. Minimum Wheel Wear

If you have a surface grinding problem, there's a good chance this 846 K-1 Dayton may be just the wheel you are seeking. Made in a wide variety of sizes . . . with shipment from stock in many cases.

SIMONDS WORDEN WHITE CO.
708 Negley Place • DAYTON, OHIO

DAYTON
GRINDING WHEELS

AN UNUSUAL OPPORTUNITY FOR SALESMEN OF INDUSTRIAL PRODUCTS

A large, long established concern has just started the manufacture of a completely new type of Retaining Ring (patented), which embodies a remarkable advance over all previous products of similar type.

Although introduced just recently, this product is National Aircraft Standard, and has won the approval and acceptance of some of America's largest industrial manufacturers.

Sales opportunities are almost endless, and we are seeking representation in every area of the United States.

If you are an experienced salesman of roller bearings, piston rings, gears, or any other type of equipment sold to plant engineers, and if your present position permits you to handle this splendid innovation with your current line, write immediately *outlining all facts about yourself.* Enclose photo, not returnable.

All applications will be treated in strict confidence.

BOX #947, PURCHASING
205 East 42nd Street, New York 17, N.Y.

(*Continued from page* 128)

FUL-VUE SAFETY GOGGLE

FUL-VUE safety goggle with 6.00 curve clear Super Armorplate lenses to protect the eyes of women workers on the industrial war front is announced by the American Optical Co., Southbridge, Mass. Specifically designed to fit the smaller features of women, the new F3142 Ful-Vue goggle is made in 42 mm. eye size. Three bridge sizes are available: 19, 21, and 23 mm. The lenses are fracture resisting, and conform to the U. S. Bureau of Standards requirements for an eye-protection lens. The goggle combines efficient eye protection against flying objects with the greatest degree of all-round visibility, comfort and appearance. No metal touches the skin.

WIRE STRIPPER

Speedex wire stripper which can be used for all types of solid or stranded wire, is being introduced by Wood Specialty Mfg. Co., Rockford, Ill. Strippers are made for wire sizes No. 8 to No. 30. Cutting blades strip insulation neat and clean without marring the wire. Different size, interchangeable cutting blades are available.

DROP BOTTOM DUMP SKID BOX

SKID box that can be dumped satisfactorily with standard fork or high-lift power truck, has been developed by the Union Metal Mfg. Co., Canton, Ohio. The new unit is an all steel box, attached to skid platform with a continuous hinge at one end. In operation the skid portion is entered with forks or platform of trucks, the box elevated and latch rings at top rear of box attached. The box may also be used as a standard skid box for unit load transportation, or handled by hand lift trucks for short operational spotting.

(*Continued on page* 132)

EVEN THE GENERAL CHANGES HIS HAT

In time of action the leader must lay aside his trim hat, strip off his gold braid and sleek attire. He looks different—but his ability and character remain the same!...PLUMB, too, dons a "service uniform". Because of Government Limitations the appearance of some Plumb Tools has been changed. But the "hidden qualities" remain the same. Plumb Tools have the same hang and balance, design and temper that won them a quality reputation for nearly ninety years. While the fine finish has gone for the duration you will recognize Plumb design and balance by the ease and speed with which it works.... Plumb is proud of its service uniform! Fayette R. Plumb, Inc., Dept. P-4, 4837 James Street, Philadelphia, Penna.

Quality Comes First — PLUMB is FIRST in Quality

"WAR-AID"

Fluorescent Fixtures *by Wheeler...*

Sturdy metal-conserving wiring channel. Non-metallic reflector with chip-proof washable surfaces. Made for 2 or 3 40-watt lamps, or 2 100-watt lamps. Easily adapted for continuous runs.

- maintain "skilled lighting" standards
- conserve critical materials

OTHER WHEELER FIXTURES

RLM One-Piece Solid Neck Reflectors

Made in Dome, Angle and all other standard types. For indoor or outdoor use.

Class II-G Dust-Tight Units

Fluorescent fixtures approved for "Class II-G" hazardous locations. Hinged cover protects lamps, sockets and reflecting surfaces. Made for two or three 40-watt lamps.

IT takes accurate "seeing" by workers to maintain today's precision standards of production. In any warplant, that means lighting of the most modern, efficient type.

To make such lighting available *in spite of wartime metal shortages*, Wheeler Reflector Company developed "War-Aid" RLM Fluorescent Fixtures. Made with minimum strategic materials... designed with "know how" gained in over 60 years of specialized experience... "War-Aid" Fixtures offer the same high-efficiency illumination that has always typified Wheeler "Skilled Lighting."

Whether you require fluorescent or incandescent illumination, Wheeler can supply *skilled lighting* for precision production. Write for catalogs of both types. **Wheeler Reflector Co., 275 Congress St., Boston, Mass.** ... New York, Cleveland. Representatives in principal cities.

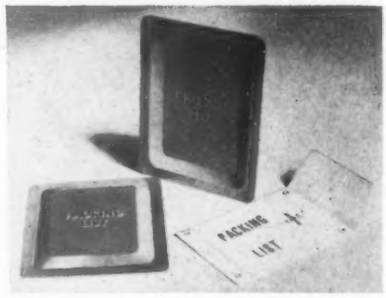
Distributed Exclusively Through Electrical Wholesalers

Wheeler REFLECTOR COMPANY

Lighting Equipment Specialists Since 1881

(*Continued from page* 130)

PACKING LIST ENVELOPE PROTECTOR

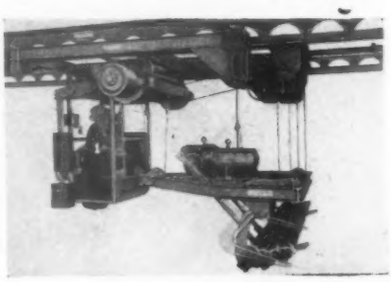


ASPHALT treated fibre protector for packing list envelopes has been developed by the Dennison Mfg. Co., Framingham, Mass., to be used in place of metal protectors. The new protector is embossed to fit over bulky packing lists, and prevents tearing and ripping, and damage account weather conditions. Outside dimensions are 5¾" x 7" with raised portions 4¾" x 6". The Dennison company states that the protector has been approved by the Office of the Chief of Ordnance, Washington.

PHOTOELECTRIC RELAY

A NEW genera purpose photoelectric relay for outdoor use is announced by the Electronic Control Section of the General Electric Co. Designated as Type CR 7505-k108 it is for applications requiring rapid and accurate counting, controlling, sorting or limiting operations. The relay can be mounted in any position and can be adjusted under actual operating conditions without removing the cover. The chassis can be removed easily from the case for inspection or servicing, or for mounting with other apparatus in a combination enclosure. Bulletin GEA 1755E gives full details.

CARRIER IS MOTOR DRIVEN



MOTOR-driven overhead pipe and rod carrier has been developed by the Cleveland Tramrail Divn. of the Cleveland Crane & Engineering Co., Wickliffe, Ohio. Operator can pick up 1500 lbs. of

(*Continued on page* 134)

this *Check list of war uses*

CAN HELP YOU SAVE TIME-MONEY-METAL WITH

MEYERCORD DECALS

DECALS ARE USED ON:	DECALS ARE USED FOR:
Airplanes	Insignia (Airplane)
Tanks	Operation and maintenance instructions
Armored cars	
Combat vessels	Stowage and packing diagrams
Cargo ships	Interior Markings (shipboard)
Blimps	
Gliders	Instrument panels (also fluorescent)
Motorized equipment	
Ordnance	Nameplates
Radar	Wiring diagrams
Combat radio communications	Fluid line identification charts
Marine — Aircraft	Airplane tail numerals
Armor — Portable	Anti-sabotage inspection seals
Electrical equipment	Invasion identification (flags)
Navigation devices	Windshield passes to vital areas
Fire control	Spare parts listings
Bomb racks	Stowage box identification
First aid kits	Phosphorescent markings (interior)
Fuel cells (rubber)	
Life rafts (rubber)	Organizational devices and insignia
Helmets	ODT compliance identification
Antennae	Octane designations
Fuel and oil containers	Nomenclature designations
Air filters	Capacity or load limit
Airplane propellers	First aid instructions
Fire fighting equipment	Assembly coordination numbers
Water pumps	Civilian Defense insignia
Tools	Dial faces
Flares, bombs and shells	Inventory numbers

Identification and instruction data requirements for war equipment are enormous. Uniformity, durability, lasting visibility and speed of application are imperative. In war—*or peace*—Meyercord Decals meet imperative demands . . . on any surface. They're durable, washable, highly visible, permit use of any color and replace strategic metal. No sharp edges, screws, rivets or bolts. This partial list of wartime decal uses may suggest their adaptability to your own product. Competent designing and technical research service available . . . free. Address Dept. 1098.

Speed Victory ▫ ▫ Buy War Bonds!

THE MEYERCORD CO., CHICAGO

World's largest manufacturer of Decalcomania

5323 WEST LAKE STREET • OFFICES IN PRINCIPAL CITIES

50th Anniversary 1943

DECALS SAVE METAL

Why SACRIFICE THE WHEEL TO GET THE WORK OUT?

Two Snagging wheels, identical in size and cost, may show the same performance in pounds of metal removed and working hours . . . Yet one wheel may show a profit and the other a loss. This has been demonstrated in numerous snagging tests. Results of one of these are shown below.

+ WHEELPOWER

of Cortland Grinding Wheels was measured by the POUNDS OF METAL REMOVED PER CUBIC INCHES OF WHEEL WEAR

CORTLAND	1.220
OTHER BRAND	0.521

— WHEELCOST

of Cortland Grinding Wheels was instantly apparent by the WHEEL-COST PER POUND OF METAL REMOVED -- BASED ON WHEEL WEAR

CORTLAND	0.021
OTHER BRAND	0.049

CORTLAND GRINDING WHEELS CORP.
Chester, Mass.

CORTLAND
For Better Snagging

(*Continued from page* 132)

stock in 12 ft. lengths from the storage room, transport and set it in racks at fabricating machines, without any floor men. Swing of load is minimized by double overhead track system. Fork assembly can be raised or lowered as required. Hoisting speed 20 FPM. Carrier speed travel is 300 FPM.

NEW TYPE SOCKET WRENCH

SOCKET wrench, called the Wedgelock, has been introduced by the F. & H. Mfg. Co., 2207 W. Jefferson St., Los Angeles, Calif. The hardened steel free-moving shoes serve as an instantaneous acting clutch. As handle comes to a stop on back swing, the wrench is immovably locked for the tightening pull. There is no play, no friction inside the wrench. Handle movement of 1/16" or less is 100% effective, making the Wedge-Lock ideal for close quarter use. Available in 4 sizes: ¼", ⅜", ½" and ¾".

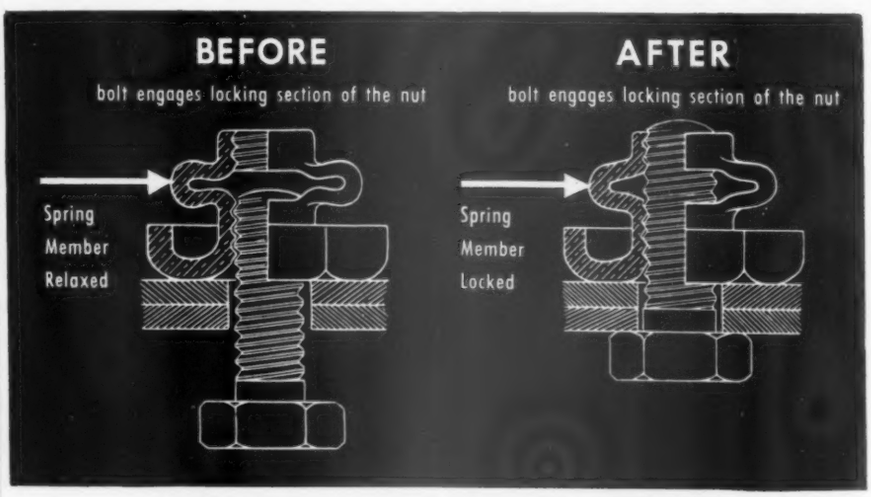
LIFT TYPE TURRET TRUCK

IMPROVED lift type turret truck is announced by the Nutting Truck & Caster Co., Faribault, Minn. The improved Salsbury has an easy to reach, hand operated hydraulic lift; load-wheel brake pedal, and operator's platform that is 4" wider than on previous models. Primary drive chain is fully enclosed. The lift platform has been tapered to permit oblique angle entrances to skids. End rail on platform is mounted in sockets for easy removal.

ELECTRONIC TIME-INTERVAL METER

NEW electronic time-interval meter for accurately measuring extremely short intervals—as low as 100 microseconds—is announced by the Special Products section of General Elec-

(*Continued on page* 136)



VIBRATION-PROOF NUTS

One-piece, all-metal construction gives Boots Self-Locking Nuts these distinct advantages over all other nuts: greater re-usability in maintenance; proof against corrosive action of oil, water and chemicals; resistance to high temperatures. Boots Nuts meet all specifications of government aviation agencies in an industry where loose fastenings will not be tolerated.

There's a BOOTS NUT for every application

ROL-TOP

BOOTS

ANCHOR

BOOTS AIRCRAFT NUT CORPORATION
GENERAL OFFICES, NEW CANAAN, CONNECTICUT

Billings always will be good

MEN of BILLINGS

will make it so.

The world wide reputation for producing honest forgings rests firmly on the shoulders of the "Men of Billings." From father-to-son, the intricate steps in the art of forging are carefully repeated. Each generation contributing the benefits of its research and ingenuity.

Todays' "Men of Billings" are hard hitting men - earnestly doing their bit in the production of essential armament forgings and industry's building tool - the wrench.

The building of tomorrow's world will be aided by the production of tomorrow's Wrenches and Shop Tools by Billings . . Yes, Billings always will be good!

FORGED TOOLS & AIRCRAFT FORGINGS

Billings Workers War Production Drive Slogan

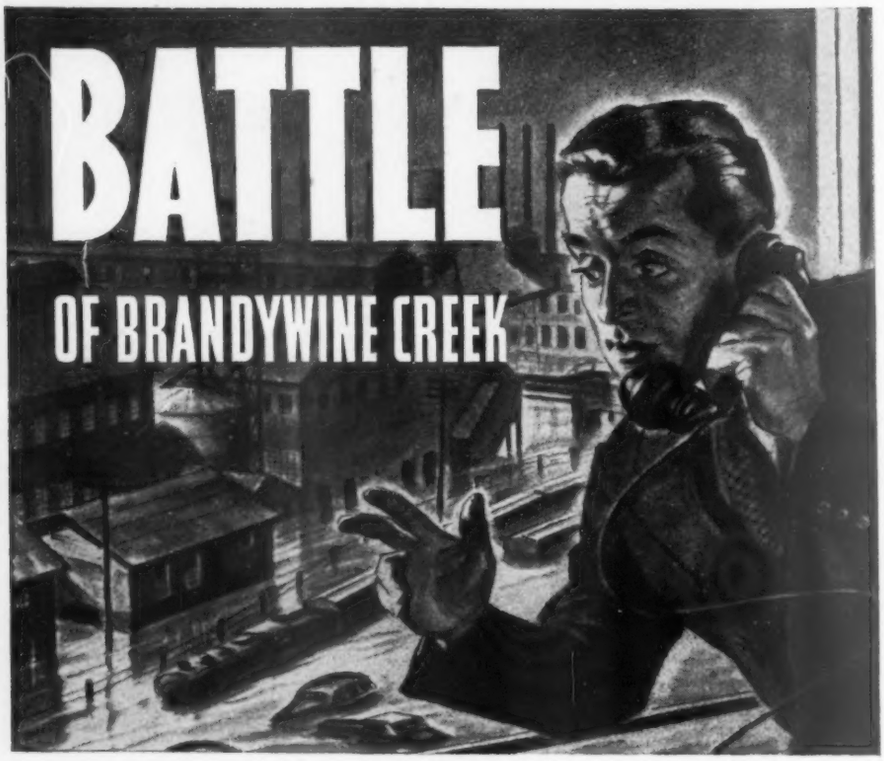
"LET'S PUT IT OVER"

FORGED Billings TOOLS

DROP FORGINGS . BOARD DROP HAMMERS

DROP FORGING & DIE MAKING MACHINERY

THE BILLINGS & SPENCER CO. HARTFORD, CONN., U. S. A.



. . . a dramatic episode in the West campaign against delay

On August 9th, 1942, Brandywine Creek overflowed its banks and flooded the property of the Lukens Steel Company in Coatesville, Pennsylvania. After the waters receded, in addition to the immediate danger of a serious epidemic, months of man-power delay was threatened in this, the home of the world's largest plate mill, because of filth, muck and mud. Trouble shooters of the West Disinfecting Company helped to prevent this delay. Roadways, buildings and material were thoroughly disinfected. Drinking fountains were made sterile and even files and records were salvaged. All this was started less than one hour after the flood had receded . . . and sick absenteeism was prevented almost completely.

West's Regular Service...While Less Dramatic...is No Less Important

Each year, dermatitis (disease of the skin) is responsible for millions of hours lost from work by the men and women in American industry. Industrial Dermatitis is an occupational hazard — and as such is preventable. Dermatitis is encouraged by improper washing or through the use of harsh or abrasive soaps or cleansers that tend to injure the skin. Irritants such as certain chemicals, petroleum products, etc. or cutting oils containing harmful bacteria with which the skin comes in contact, are just a few of the common causes of dermatitis. West supplies industry with special hand soaps, protective creams and disinfectants that help protect workers against this production-wasting scourge.

FREE Literature on Protection Against Dermatitis will be sent on request.

55 BRANCHES • HELPING TO GUARD INDUSTRIAL HEALTH • COAST TO COAST

WEST DISINFECTING Company

42-16 WEST STREET - LONG ISLAND CITY - N. Y. - Dept. P.

(*Continued from page* 134)

tric Co., Schenectady, N. Y. The meter is designed for measuring the time interval between two events which can be converted into electrical impulses, such as the elapsed time between the closing of two controls between two impulses to a phototube; and between an electrical impulse and a light impulse.

INTRODUCE WARTIME STAPLING MACHINE

NEW stapler employing minimum of critical materials has been introduced by Ace Fastener Corp., 3415 No. Ashland Ave., Chicago. It loads a full strip of 210 No. 400 Pilot standard staples. Wherever strength, durability and precision were required steel has been used. Machine is characterized by smooth, easy, efficient operation. The new model is known as No. 402-V.

ANTI-SLIP INDUSTRIAL FLOORING

New industrial flooring, developed especially for use in street cars and buses, has been introduced by Industrial Divn. of the Armstrong Cork Co., Lancaster, Pa. Name is Traffex. It is said to be low in cost, to have good wear-resistant qualities, and to dry. Comes in three colors—brown, red, black. Available in regular size mats—40″ x 36″. 20″ x 36″, and 18″ x 40″, in 3/16″ and ¼″ thickness.

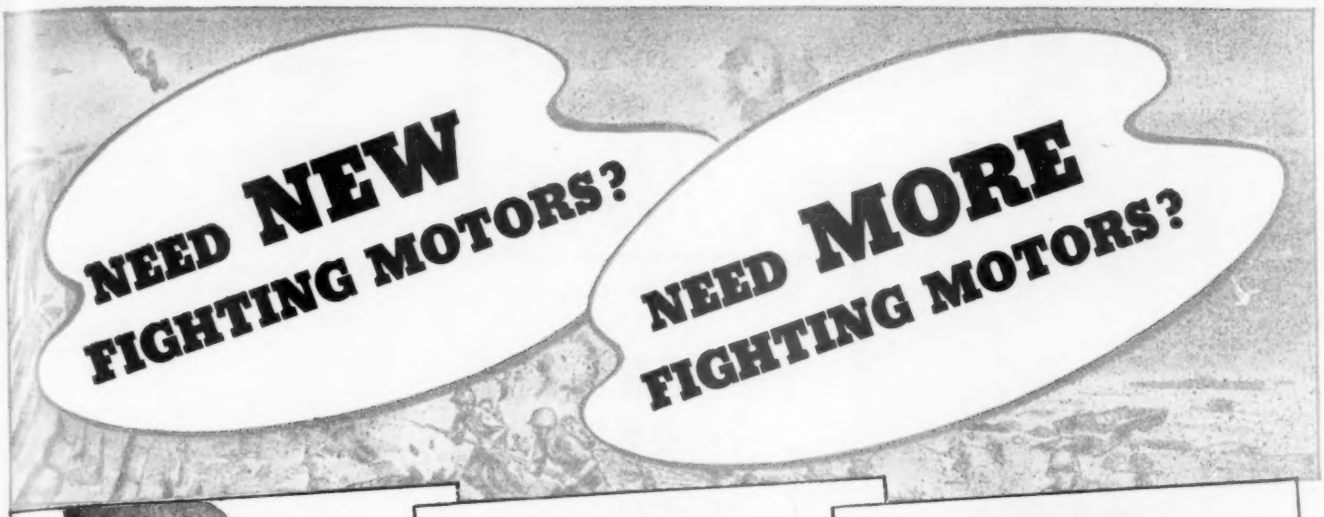
CONTOUR AND CUTOFF BANDSAW

ALL-purpose contour and cutoff band saw for wood or plastic stock up to 8⅝″ thick is being offered by Boice-Crane Co., 953 Central Ave., Toledo, Ohio, in bench and floor models. The deep throat allows 27″ diameter cutting. Blade guides handle all blades from 1/8″ to 3/4 and adjust by single knob control. Table is 15″x15-1/2″, is rigidly supported; tilts 45 degrees to the right and 10 degrees to the left—indicated by accurate scale.

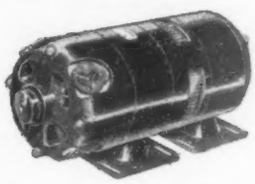
ELECTRO-THERMO-STATIC FLOW SWITCH

FOR resistance welding and other applications, a new electro-thermostatic flow switch which detects the lack of proper cooling water required for adequate cooling of ignitron tubes, is announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The switch is designed for use where a liquid is used for cooling and where a smooth positive acting flow switch is required. Further information may be secured from Department 7-N-20.

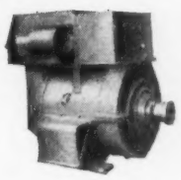
(*Continued on page* 138)



1. **TINY BUT VITAL,** this G-E gear-motor for aircraft service weighs only 8 ounces. It provides driving force for protective devices and small controls. Rating: 3 watts, intermittent, at approximately 100 rpm.



2. **DEADLINESS** of our land, sea, and air weapons has been increased—by application of the G-E amplidyne. Along the industrial front this versatile new generator-type amplifier is speeding production.



3. **EFFICIENT COOLING** of this totally enclosed d-c motor is accomplished by an air-to-air surface cooler built on the machine. High output from small frame size is the result.

THIS G-E SERVICE IS MOBILIZED TO HELP YOU

IF THE war machines you build must be equipped with electric motors or generators, G.E. may be able to help you boost your output or motorize your designs in a better way. The important point is to get in touch with us *right at the start* of your planning.

Already, by close teamwork with builders of combat equipment, we have helped to engineer and build scores of ingenious fighting motors—many too secret to show here. Thus, a great fund of G-E experience is "on tap."

Facilities for further work on fighting motors are now available—not for every type, but possibly for the kind of motor that's right for your job. In any event, we'll give your problem prompt, realistic consideration, telling you frankly just how far and how fast we can serve you.

G-E engineers are helping apply all kinds of fighting motors to all kinds of war equipment. Your local G-E representative will help you take advantage of this service. *General Electric Company, Schenectady, New York.*

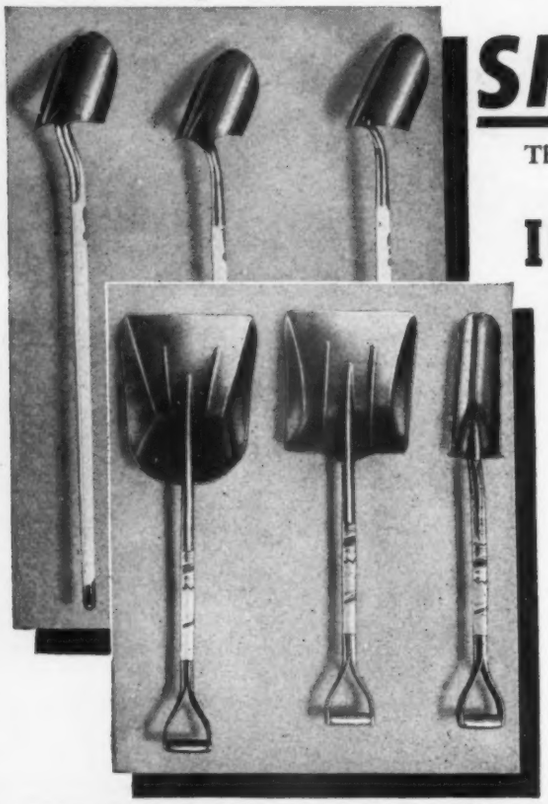
GENERAL ELECTRIC

750-215-8030

FIGHTING MOTORS

All Blade Finishes now Black except Molders' Shovels and Grain Scoops which may be furnished with Polished Face and Brushed Back.

A "Good Buy" in Shovels



That's what you get when you specify . . .

INGERSOLL SHOVELS

One reason they are such a "good buy" is that their blades are made of TEMCROSS Steel — guaranteed *not* to split at the blade edges. You get this extra value and better service without paying a premium for it.

So whenever you order Shovels, be sure to specify "Ingersoll" — "A Borg-Warner Product."

Ingersoll Steel & Disc Division

Borg-Warner Corporation

New Castle, Indiana

Plants: New Castle, Ind.; Chicago, Ill. Kalamazoo, Mich.

For Savings Specify

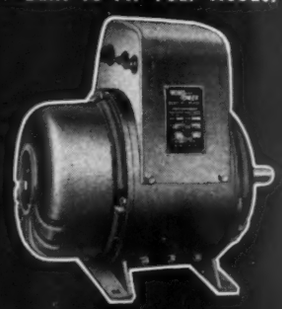
DARNELL CASTERS

For light or heavy duty service Darnell Casters and Wheels are made for a long life of trouble-free usage

DARNELL CORP. LTD.,
LONG BEACH, CALIFORNIA,
60 WALKER ST. NEW YORK, N.Y.
36 N. CLINTON, CHICAGO, ILL.

AC and DC Generators

—750-7500 Watts.
—Prompt Deliveries.
—Built to Fit Your Needs.

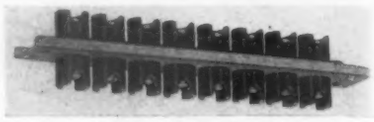


17 years specialized experience in manufacturing electrical generators of all types. Send us your specifications and let us quote you.

Wind Power Mfg. Co.
Since 1925 Dept. B, Newton, Iowa

(*Continued from page* 136)

MULTIPLE TERMINAL BLOCK



Multiple terminal block for sub-panel and chassis construction, with feed-thru terminals, is announced by Curtis Development & Mfg. Co., 1 No. Crawford Ave., Chicago. Block is designed to meet present day demands of electronic and electrical design, which require external terminals. Can be supplied with any number of terminals needed.

SPECIAL VAPOR AND SOLVENT DEGREASERS

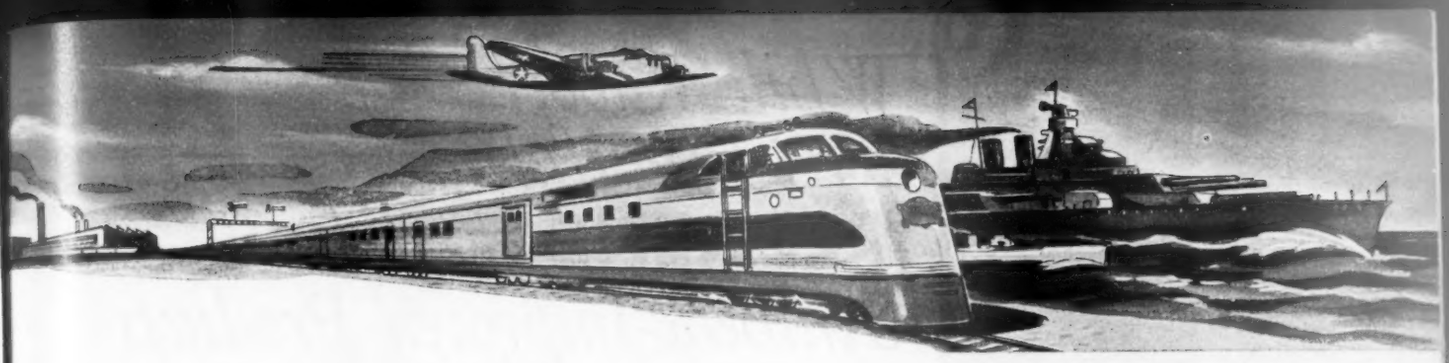
SPECIALLY designed vapor and solvent degreasers using the inhibited tetrachlorethylene solvent known as Phillsolv, are offered by the Magnus Chemical Co., Inc., Garwood, N. J. These degreasers are said to have distinct advantages are trichorethylene degreasers. They are air-cooled. Tetrachlorethylene boils at higher temperature, and has higher density of both liquid and vapor, making for more effective cleaning and lower operating costs. They also offer a known-in-advance operating cost per hour.

BATTERY TERMINAL PULLER

BEARING and Battery terminal puller known as Steelgrip No. 13 and 13A, is announced by Armstrong Bray & Co., 5364 Northwest Highway, Chicago, Ill. It is made in two sizes (2" and 5" reach). The arms are drop forged, heat-treated steel, of great strength. The hooks are thin enough so that they will fit between bearings and motor housings, and long enough to reach the bearing race.

HIGHLY VISCOUS LIQUID STRAINER

NEW Strainer for handling highly viscous liquids or liquids that are solid at room temperature is announced by the Blackmer Pump Co., Grand Rapids, Mich. Standard capacities are 20, 50, 100 and 200 GPM. Pipe sizes 1, 2 and 3 inches. Maximum operating pressure is 50 psi at temperature of 600 deg. F. The jacket is suitable for 125 lbs. steam pressure. The bottom and sides of the unit are completely enclosed in a steam jacket. Two inlet and two outlet ports are provided for steam line connection.

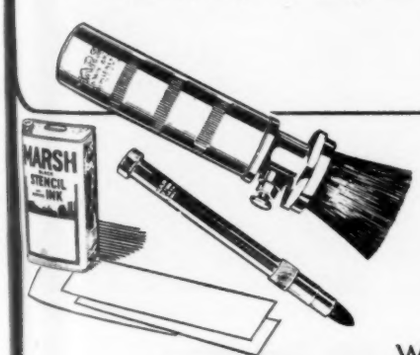


SERVING "U. S."
...in the ARMY, NAVY and WAR PLANTS

Serving "U. S." means serving *you*. Yes, stencil markings are serving you in the Army, Navy, Air Forces, Quartermaster Medical Corps, Arsenals, Government branches and in War Plants. Our Government places great importance on bold, clear, permanent markings of everything from clothes to the gigantic Flying Fortresses. This is what they say . . . "Free-hand lettering is unkempt, easily obliterated or made illegible. It pays to use STENCILS."

MARSH STENCIL MACHINE
with *speed cutting* . . .

A Marsh Stencil Machine cuts an oil board stencil in ½ minute at a cost of only ½ cent. Shipments can be marked clear and correct in 3 seconds. A Marsh Oil Board stencil, because of its superior quality, can be re-used 2000 times. Your shipments, when stenciled, enhance the prestige of your business, add to your reputation. Ship them the modern way . . . STENCIL MARKED. Marsh Machines meet Government specifications which specify three sizes . . . ½", ¾" and 1". Write for free handbook covering all the facts on how to ship the modern way. No obligation.



MARSH FOUNTAIN BRUSH, OIL BOARD, FELT TIP MARKER AND STENCIL INK

FOUNTAIN BRUSH: Obsoletes dipping brush into unsightly ink pot. Saves many hours every week. Saves 20% on ink.

OIL BOARD: Cuts easy . . . saves money on ink because it's non-absorbing . . . and *oil-impregnated.*

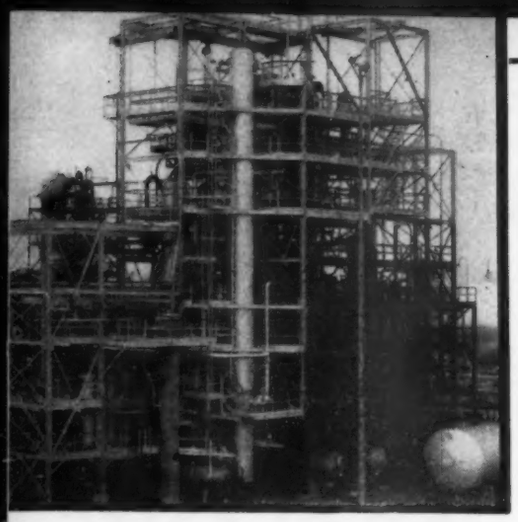
FELT TIP MARKER: Costs less per marking. ". . . gallon of ink goes as far as $20 worth of crayons."

STENCIL INK: Marks on wood, cartons, paper, sacks, burlap, stone, metal surfaces. 8 colors.

WRITE . . . WIRE . . . OR PHONE

MARSH

MARSH STENCIL MACHINE CO. 57 MARSH BLDG. BELLEVILLE, ILL.



While Rubber was Plentiful **REPRENE** *stood for Synthetic-Improved Products*

FOUR and a half years before Pearl Harbor, Republic announced synthetic-improved mechanical rubber products—branded "REPRENE." After long research and actual field tests in 1937, these improvements had become so evident that there was no hesitancy about adding synthetic products to the Republic line. "REPRENE" hose and belting were found to have characteristics never possible with natural rubber. Oil resistance was one. Others were resistance to light, heat and age. Since oil and grease and heat are common in most industrial uses, these synthetics then were compounded for new and different products—packing and molded goods. During the war effort, new "REPRENE" products have been developed which never could have been practical with natural rubber. So, for over six years, "REPRENE" branded mechanical products have been giving improved service in many industries.

Accredited Distributor

• For the prompt, efficient attention so important today on needs for Republic Rubber Products—as well as other types of equipment—industry calls on the Republic Distributor. His strategic location, highly trained personnel and complete facilities make him one of war industry's most effective weapons against down time.

WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION

REPUBLIC RUBBER

YOUNGSTOWN 1 • • OHIO

HOSE • BELTING • MOLDED GOODS • PACKING • EXTRUDED PRODUCT

DIVISION OF

LEE RUBBER & TIRE CORPORATION

Leather serves best

In thousands of mechanical applications both on the civilian and war fronts . . . and as an aid to greater safety and efficiency on the production lines . . . leather is one material that stands head and shoulders above any other. It has an unusual combination of qualities which make it tougher, more resilient, stronger and more pliable. It will carry on, giving longer, more economical and satisfactory service, where other materials might fail.

But—to bring out the very best in leather, the experience, ability and integrity of the manufacturer is most important. Our 65-year reputation for creating products of dependable quality, for special and standard use, is well known.

Chrome leather tool bag used for small hand tools in aircraft assembly. Resistant to abrasive wear.

Chicago Rawhide Products on the production lines—

Electric drill holder, stitched and riveted for extra strength. Used in aircraft production.

Non-sparking cup used in powder plants for mixing explosives. Has wedge shaped bottom.

Manufacturers of Leather and Synthetic Rubber Products for Mechanical Application

CHICAGO RAWHIDE MANUFACTURING CO.

Established 1878

1301 ELSTON AVENUE, CHICAGO, ILLINOIS

DETROIT • NEW YORK • PHILADELPHIA • LOS ANGELES • PITTSBURGH • BOSTON • PEORIA • SYRACUSE • CLEVELAND • CINCINNATI

Among the ASSOCIATIONS

DISTRIBUTION OF WAR SURPLUSES AND POST-WAR PROCUREMENT DISCUSSED AT WASHINGTON

The Association of Purchasing Agents of Washington, D. C., held its regular monthly dinner meeting on July 13, 1943, at the Mayflower Hotel. The meeting was well attended and the applications of several new members were accepted.

Clifton E. Mack, Director of Procurement, U. S. Treasury Department, and president of the local association presided. Following reports of the membership, publicity and education committees there was a panel discussion on a symposium prepared and read by Roland M. Brennan, Purchasing Officer, District of Columbia, on the subject "Post War Procurement and Distribution of War Surpluses." This is a subject of nation-wide interest and of special concern to Purchasing Agents. The paper pointed out that large manufacturing concerns now have plans on their drafting boards looking toward post-war production, and in line therewith studies by the U. S. Chamber of Commerce indicate that public demand for a wide variety of things from automobiles to homes and household equipment will be much greater than is generally supposed.

Mr. Brennan stated that there has developed in the District of Columbia a tremendous backlog of requirements for consumer durable goods, and expressed the opinion that a similar condition existed throughout the nation. The report also brought out that the Government will have on hand if the war comes to a sudden termination vast quantities of all kinds of supplies, with an estimated worth of $50,000,000,000 (fifty billion), as compared with $5,000,000,000 at the end of the last war. In this connection H. R. Bill 2795, known as the O'Leary bill, passed June 9 of this year, provides for a Surplus War Property Committee to make a full and complete study of the problem presented, and to report to Congress on the need for additional legislation for the disposal of war materials. The big problem of course is to dispose of this material with a minimum of loss to the government, and with a minimum of disturbance to the national economy.

(*Continued on page* 144)

WHO, WHAT & WHERE OF THE OFFICIAL ROSTER OF THE NEW YORK ASSOCIATION

Here's a brief business-association biography of the officers and members of the board of the Purchasing Agents Association of New York for the 1943-44 term, who formally took over the reins of administration at the June meeting:

Norman O. Aeby, the new president, has been a member of the National Association of Purchasing Agents for 28 years. His first activity in association affairs was the organization in cooperation with others, of an association in Columbus, Ohio, in 1915, which he served as its first president. At that time he was Purchasing Agent for the Jeffrey Manufacturing Co. In 1916 he was elected vice president of the National Association, serving on the first Board of Directors of the new Association. In that capacity he was active in the formation of new associations at Springfield, Toledo and Cincin-

(*Continued on page* 150)

OFFICERS, PURCHASING AGENTS ASSOCIATION OF NEW YORK

Left to Right: James L. Crosbie, Board Member; David M. Meeker, Vice President; Norman O. Aeby, President; Millard W. Merrill, Vice President; E. B. Fielis, Treasurer; George F. Plate and J. H. Ewing, Members of the Board.

INSURANCE COMPANY BUYERS HEADED BY J. PHILIP CAMP

J. Philip Camp, Purchasing Agent of the Phoenix Mutual Life Insurance Company of Hartford, Conn., succeeds J. A. Young, assistant secretary of the Monarch Life Insurance Company, as president of the Association.

C. L. Gates of the National Fire Insurance Company of Hartford was elected vice president;

William E. Lutz of the Caledonian Insurance Company, Hartford, was re-elected treasurer; and

Edwin Johnson of the Massachusetts Mutual Life Insurance Co., Springfield, was reelected secretary.

The principal speaker at the annual meeting was L. A. Newman of the Remington Rand, Inc., who spoke on the subject "Maintenance and Conservation of Business Machines."

Because of traveling difficulties, it was decided to hold only four meetings a year instead of eight as has been the custom.

NYSTROM HEADS NORTHERN CALIFORNIA ASSN.

Mervyn C. Nystrom, Assistant General Purchasing Agent for the Southern Pacific Company was elected president of the Purchasing Agents Association of Northern California at its annual meeting held at the Hotel St. Francis.

Other officers who will serve with Mr. Nystrom for the fiscal year 1943-1944 are: First Vice President, Otto Petersen, Braun-Knecht Heinman Co.; Second Vice President, Lyn L. Shafer, The American Rubber Mfg. Co.; Secretary, Russell F. Hendricks, E. H. Edwards Co.; Treasurer, L. A. Wilbur, Tubbs Cordage Co.

In addition to the officers the following were elected to serve on the Board of Directors of the Association: Clyde S. Yerge, Oakland Public Schools; Ralph G. Norback, W. P. Fuller & Co.; Henry T. Elkington, Philadelphia Quartz Co.; George H. Houston, Simons Co.; Cyrus L. Rossi, American Bitumuls Co.; Fred Kelleway, The California Wire Cloth Corp.; Robert Haayden, Contractors, Pacific Naval Air Bases. Elected to serve a five year term on the Finance Committee was William C. Haack, M. J. B. Co. and Western Can Co.

BIRMINGHAM P.A.s FOREGO SCHEDULED "DUTCH" MEETING

"Speedy" Quick, Secretary of the Purchasing Agents Association sent the following self-explanatory notice to the membership on the July 15 meeting: "We understand that, through the courtesy of our T.C.I. representatives, all of our members have been invited to the buffet

(*Continued on page* 144)

The First Word
IN CONSTRUCTION
The Last Word
IN WEAR!

"BIG FIST" BRAND SHOVELS ARE ACKNOWLEDGED LEADERS AMONG ALL ALLOY GRADE SHOVELS

There is longer life in "Big Fist" Shovels because they are built—blade, handle, and grip—to cost less in the long run.

Make a note to specify "Big Fist" on your next shovel order and watch your shovel costs go down and down.

THE STEEL I-BEAM HANDLE REINFORCEMENT

The Steel I-Beam adds a minimum of 30% more strength in the section above the socket where 65% of the handle breaks occur. It gives lightest and strongest handle reinforcement—yet retains all resiliency and flexing ability needed for full efficiency.

THE WOOD SHOVEL AND TOOL COMPANY · BIG FIST · SHOVEL · NORTHERN ASH HANDLE · PIQUA, OHIO U.S.A.

THE WOOD SHOVEL AND TOOL COMPANY · PIQUA, OHIO

A NATIONAL ORGANIZATION *SPECIALIZING EXCLUSIVELY* IN SHOVELS, SPADES AND SCOOPS

Tough as a Commando
-and like commandos, given those jobs that require "the best!"--
For those assignments where service conditions are known to be unusually severe, or where they carry the unknown "X-value" of stress that cannot be exactly figured, British Commandos and American Rangers are chosen in warfare. For those same assignments in war equipment, Ampco Metal is the usual choice of design or operating engineers.
This special bronze alloy, like those special shock troops, has established a splendid reputation for delivering more than is expected of it. For a combination of high strength, exceptional life through resistance to wear, high fatigue strength, and general all-around versatile performance, Ampco Metal is without equal in the bronze alloy field. It plays a part in the construction of most aircraft, heavy ordnance, heavy machinery and machine tools. . . . Put Ampco Metal to service in your equipment where parts are failing, and gain the satisfaction of solving a difficult metal problem.
Ask for "File 41" — Engineering Data Sheets that give case histories and technical data. . . . It's free.
AMPCO METAL, INC., Milwaukee 4, Wis.
DEPARTMENT PA-8
ARMY E NAVY
AMPCO METAL
AMPCO
THE METAL WITHOUT AN EQUAL

(*Continued from page* 142)

luncheon and preview of movie titled 'To Each Other' on July 15. Knowing that, as a P.A., this would appear a better buy than our previously scheduled 'Dutch' meeting on the same date, your brass hats have decided to yield to the Steel Corporation. So, Mr. Marbury's "super-attraction has again been postponed to Thursday nite August 19. So, see you at 12:30 Thursday, July 15, Terrace Ballroom, Thomas Jefferson Hotel."

DISCUSS WAR SURPLUS DISTRIBUTION

(*Continued from page* 142)

"All a government Purchasing Agent can do" said Mr. Brennan is to be alert at all times, to keep abreast of war controls, and to keep adequately supplied with procurable maintenance, repair and operating supplies required to keep things going, as well as sponsoring intensive conservation measures. At the same time he should have before him an inventory of his department's requirements so that he will be in an advantageous position to procure the commodities he needs from sources available when the war is over."

The meeting was addressed by Lewis A. Jones, a past president of the National Association of Purchasing Agents and formerly president of the Association of Purchasing Agents of Eastern New York; L. I. Whiteford, resident of the Purchasing Agents Association of Baltimore, and James Gaston, National Director and Purchasing Agent of the City of Baltimore.

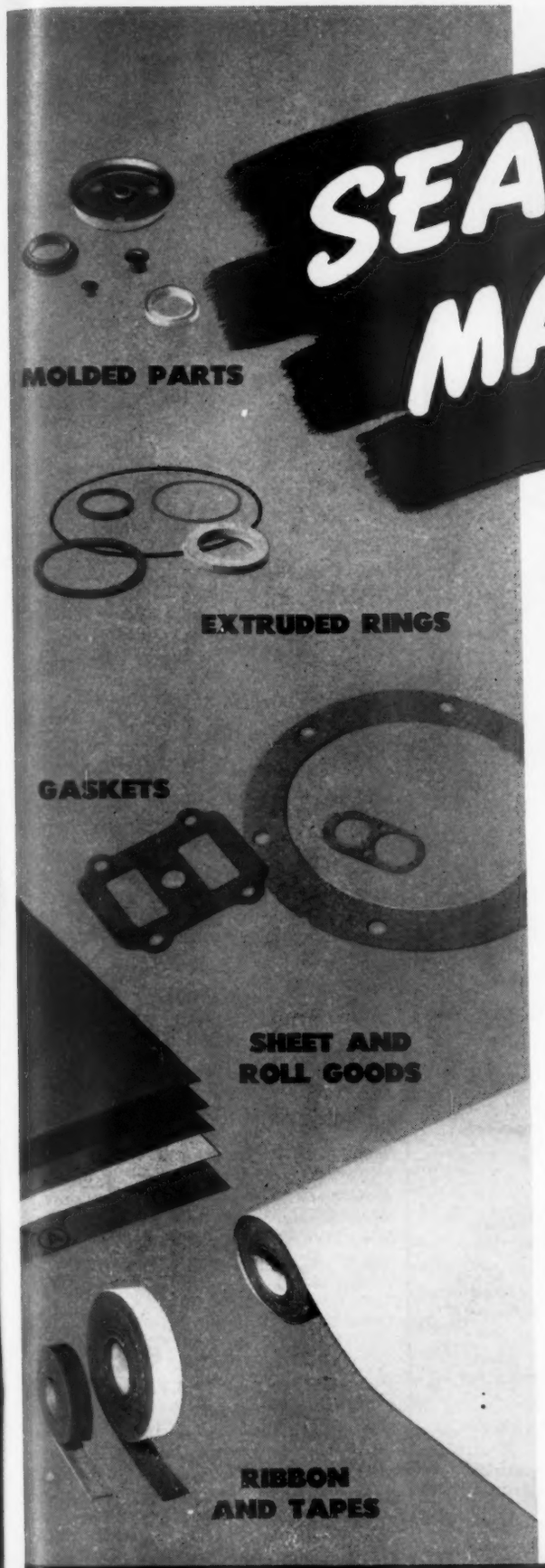
ROBT. J. DUERLER HEADS CINCINNATI ASSN.

New officers of the Purchasing Agents Association of Cincinnati for the 1943-44 term are as follows: President, Robert J. Duerler, Cincinnati Milling Machine Company. First Vice President, E. L. Clayton, Philip Carey Mfg. Co., Lockland, Ohio; Second Vice President, Albert H. Bader, Joseph T. Ryerson & Son, Inc.; Secretary, Gilbert W. Riches, Newport Rolling Mill Co., Newport, Ky.; Treasurer, Jac R. Breese, Breese Bros. Co. Directors: George De Silver, Pickering Hardware Co.; E. C. Fredricks, Fredricks Steel Co.; Bernard Toerner, Mutual Mfg. & Supply Co. National Director, Louis G. Pochat, Proctor & Gamble Co.

C. R. BURRIDGE IS 1ST PRESIDENT ESSEX-KENT ASSN.

C. R. Burridge, Backstay Standard Co., Ltd., Windsor, Ont., is the first president of the Essex-Kent Purchasing Agents Association, recently organized to serve the industrial centers of Western Ontario, with headquarters at Windsor, and E. E. Mulvenna, Standard Paint & Varnish Co., Ltd., Windsor, is the first secretary-treasurer. These gentlemen and the following, make up the association's

(*Continued on page* 146)



SEALING MATERIALS

FOR practically all ordinary sealing jobs—and for many unusual ones—you can get the *right* materials from the Armstrong Cork Company. Armstrong makes more than fifty sealing materials in the form of roll goods, sheets, gaskets, strips, ribbon, tapes, molded shapes, or extruded rings.

Armstrong has developed each of these materials to solve a specific type of sealing problem. Some of them are cork compositions. Many are compositions made from various synthetic rubbers, from granulated cork and synthetic rubber, or from cork and natural rubber. Still others are fiber sheet packings, rag felt papers, or natural cork.

In this broad assortment of specialized products, very probably there are materials which have exactly the physical properties required to sure-seal the products you make or the equipment you use. Find out more about them by writing for a free copy of the fact-filled booklet, "Armstrong's Gaskets, Packings, and Seals." Armstrong Cork Company, Industrial Division, 7208 Arch St., Lancaster, Pa.

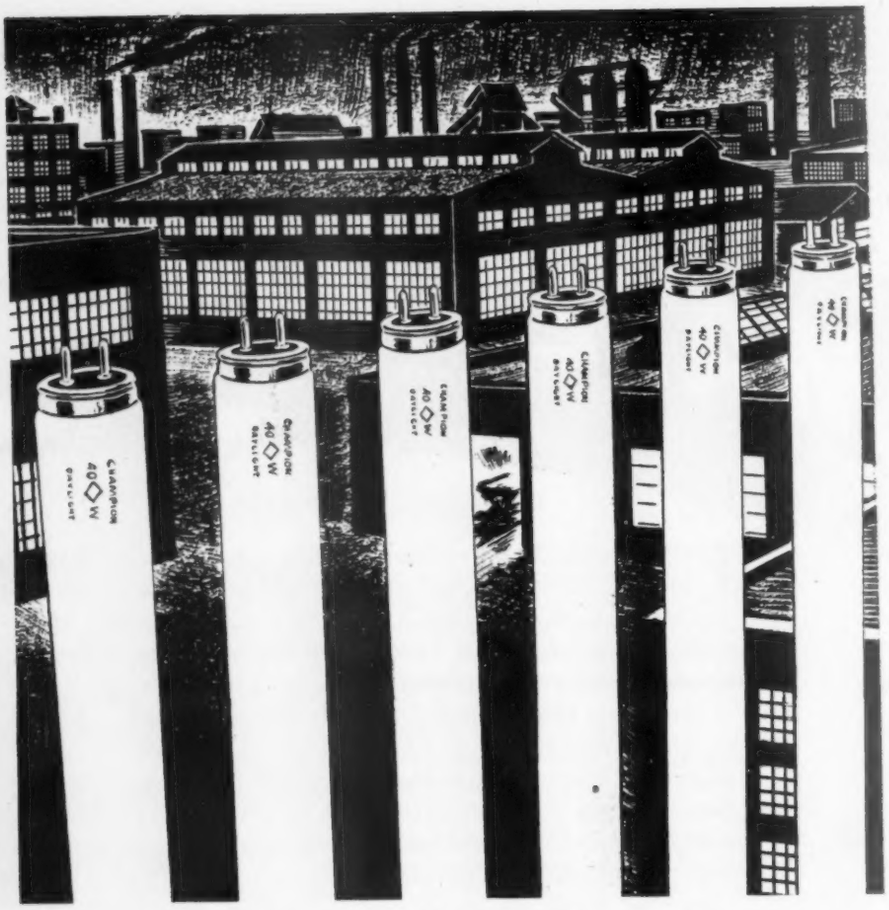
ARMSTRONG'S INDUSTRIAL SPECIALTIES

Natural Cork Products: Balls, Closures, Floats, Polishing Wheels . . . and others; *Cork Composition Products:* Balls, Bulletin Board, Carboy Cushions, Expansion Joint, Friction Parts, Gaskets, Polishing Wheels, Ribbon . . . and others; *Mechanical Specialties:* Synthetic Rubber, Cork-and-Synthetic-Rubber, Cork-and-Rubber; *Rag Felt Papers:* Sheathing, Vibration-Damping, Gasketing, Space-Packing, Specialties; *Transportation Floors:* Linoleum, Plain Automat, Ribbed Automat, Mastic Armoflor, Traffex; *Aircraft Materials:* Wingwalk, Airoflor, Glazing Strip, Cushion Pads, Gaskets, Packings, Seals; *Fiber Sheet Packings:* Fibrated Leather and Plant Fiber types.

The specialties listed above are just a few of the more than 350 dependable products which are made in the sixteen plants of the Armstrong Cork Company.

ARMSTRONG CORK COMPANY

INDUSTRIAL DIVISION



STAUNCH PROTECTION
for Your Production

Good lighting is helping many a war plant to:

- increase precision of workmanship
- reduce spoilage and waste
- conserve nervous energy and build morale (good lighting increases in value as average age of workers increases)
- promote safety as well as efficiency

Get this manual of practical, timely information on making the most of existing lamps and lighting, mailed upon receipt of your name, company and position. Ask for Champion Manual H.

Users of CHAMPION Fluorescent and Incandescent Lamps enjoy these four important advantages:

1. **Champion Quality** — guaranteed to equal or exceed Federal Specifications and backed by exclusive specialization on fine lamps since 1900.
2. **Champion Service** — stocks always ready to meet priority orders and trained experts in the field to assist you on lamp or lighting problems.
3. **Champion Economy** — the lowest costs, lamp for lamp, illumination quality and performance considered.
4. **Champion Distribution** — through qualified industrial supply houses experienced in meeting today's critical needs swiftly and efficiently.

CHAMPION LAMP WORKS
Lynn, Massachusetts
A DIVISION OF CONSOLIDATED ELECTRIC LAMP CO.

(*Continued from page* 144)

executive committee: P. E. Church, Canadian Automotime Trim, Ltd., Windsor; J. B. Macon, Canadian Motor Samples, Ltd., Windsor; R. McLellan, Wallaceburg Brass, Ltd., Wallaceburg; and G. J. Oldershaw, Union Gas Co., of Canada, Ltd., Chatham. The association will hold its regular meetings on the 2nd Tuesday of each month at the Norton Palmer Hotel, Windsor.

BUFFET SUPPER AND DANCE AT NEW ORLEANS

Members of the Purchasing Agents Association of New Orleans and their ladies had a pleasureable buffet supper and dance from "nine til," Friday, July 9th, slack suits and sport clothes being the proper dress for the occasion. The entertainment committee in charge was headed by Theo Harvey, chairman, and Herman Prager, vice-chairman. At the regular monthly dinner meeting July 12, the Educational Committee with R. N. Dowling as chairman, had arranged a C.M.P. questions and answers program lead by members of the War Production Board. Priority managers and others interested took part in this meeting.

DISCUSS WAREHOUSING UNDER CMP AT BRADFORD

Members of the Purchasing Agents Association of Northwestern Pennsylvania discussed CMP regulations and warehousing under the Controlled Materials Plan, at their July 2nd meeting held in the Emery Hotel at Bradford. Speakers at the meeting were C. S. Gedney, R. I. Coghill and Paul Stapleton of Joseph T. Ryerson & Son, Inc., Buffalo.

SYNTHETIC RUBBER DISCUSSED AT WESTERN MASS. MEETING

Richard K. Opper, development engineer of the U. S. Rubber Company, reviewed the development of synthetic rubbers and their potential uses at a meeting of the Purchasing Agents Association of Western Mass., in Springfield. Motion pictures of the rubber industry were displayed, and in the course of his talk Mr. Opper stated that synthetic rubber has every property essential to industrial rubber goods.

VARIETY IN ACTIVITIES OF PORTLAND ASSOCIATION

Secretary Clifford B. Amos of the Purchasing Agents Association of Portland, procured tickets for the broadcast "Is Labor Cooperating in the War Effort?" a national network radio program "Town Meeting of the Air" presented at the Portland Auditorium. The first July meeting was devoted to a discussion of National releases, and at the following meeting, the General Petroleum Company presented the film "Only an Informed America is an Invincible America" with Raymond Gram Swing as commentator. July 18th, the members en-

(*Continued on page* 148)

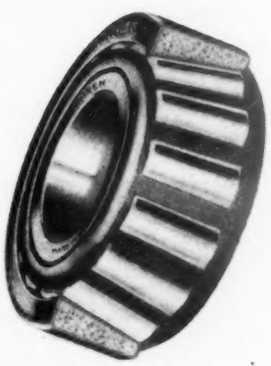
JAP-KILLING MACHINE

Geraldine Maurer doesn't look like a very belligerent person and she actually isn't one either, but her husband has just gone into the army and she likes to call the machine she operates at one of the Timken Bearing Plants "her Jap-killing machine." Perhaps that is one reason why her daily production is running 20% above the average.

Actually she is grinding the surfaces of Timken Bearings for Army and Navy airplane engines. These bearings must be accurate to almost infinitesimal limits, for the results could be serious if but one bearing should fail out of the 36 used in an 18-cylinder engine.

Timken Bearings by untold millions are helping to make better planes, trucks, ships, tanks and guns. When it's over they'll pick up where they left off in helping to give you better automobiles, trucks, farm implements, railroad passenger and freight cars, locomotives, and industrial machinery of every kind.

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO



TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS

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from the desk of J. W. KING
PURCHASING AGENT
12:30—Ed: when you get back, look these over—I think Armour has the answer to our abrasive problem
JWK
ARMOUR'S ELECTROCOATED ALUNDUM CLOTH comes in 50-yard economy rolls, to end lost time between stockroom and job.
ARMOUR'S FIBRE COMBINATION SANDING DISCS help speed up die casting seam removal, beveling and finishing.
ARMOUR'S ALUNDUM CLOTH SHEETS. Comes in 9 x 11-inch sheets, for precision hand finishing of metal surfaces.
ARMOUR'S ALUNDUM CLOTH SPIRAL WOUND BANDS available in a wide range of sizes and grits for any size clean-up job.

WHATEVER your abrasive problem, chances are there's an Armour Abrasive that answers it right to a "T."

For the Armour Sandpaper Works are specialists in abrasives to meet today's industrial needs . . . large or small.

From the most minute clean-up operation to the biggest finishing job, there's an Armour Abrasive designed to do the job cleaner, faster, better.

The four Armour Abrasives shown here are just a sample. We'd like to show you the rest of the Armour Abrasive line, with special reference to helping you speed up today's production. Call us in. No obligation.

ARMOUR SANDPAPER WORKS
Division of Armour and Company
1355 WEST 31ST STREET · CHICAGO, ILLINOIS

(*Continued from page* 146)

joyed a summer picnic. At another meeting, Donald A. Ladenberger, Special Agent of the F. B. I. spoke on the subject "Position of the F. B. I. in Wartime."

OFFICIAL ROSTER OF TEXAS PANHANDLE ASSOCIATION

O. M. Prigmore, the Cabot Companies, Pampa, Texas, is president of the Purchasing Agents Association of the Texas Panhandle which was recently admitted into membership in the national association. J. G. Cabbell, Panhandle Power Light Co., Box 11, Borger, Texas, is vice president. M. T. Rogers, Phillips Petroleum Co., Box 357, Borger, is secretary. The Board of Directors consists of: J. R. Boone, Shamrock Oil & Gas Corp., Amarillo; L. M. Fox, United Carbon Co., Borger; A. L. Prigmore, Portland Gasoline Co., Pampa; T. R. Cross, Paramount Supply Co., Amarillo; and, W. E. Smith, Morrow-Thomas Hardware Co., Amarillo. G. F. Branson, S.W. Public Service Co., Amarillo, is national director; J R. Boone being alternate.

SHIPPING CONTAINER FORUM AT LOS ANGELES

Qualified men from industry discussed all phases relative to shipping containers at a recent meeting of the Purchasing Agents Association of Los Angeles. Government controls, the recent situation, and trends were discussed in detail. Byron White is Chairman of the Association's Noon Luncheon Committee.

ROBERT C. JARREL HEADS TRI-STATE ASSOCIATION

Robert C. Jarrell of the Barium Reduction Corp., South Charlestown, W. Va., was elected president of the Tri-State Purchasing Agents Association at the annual meeting of that group.

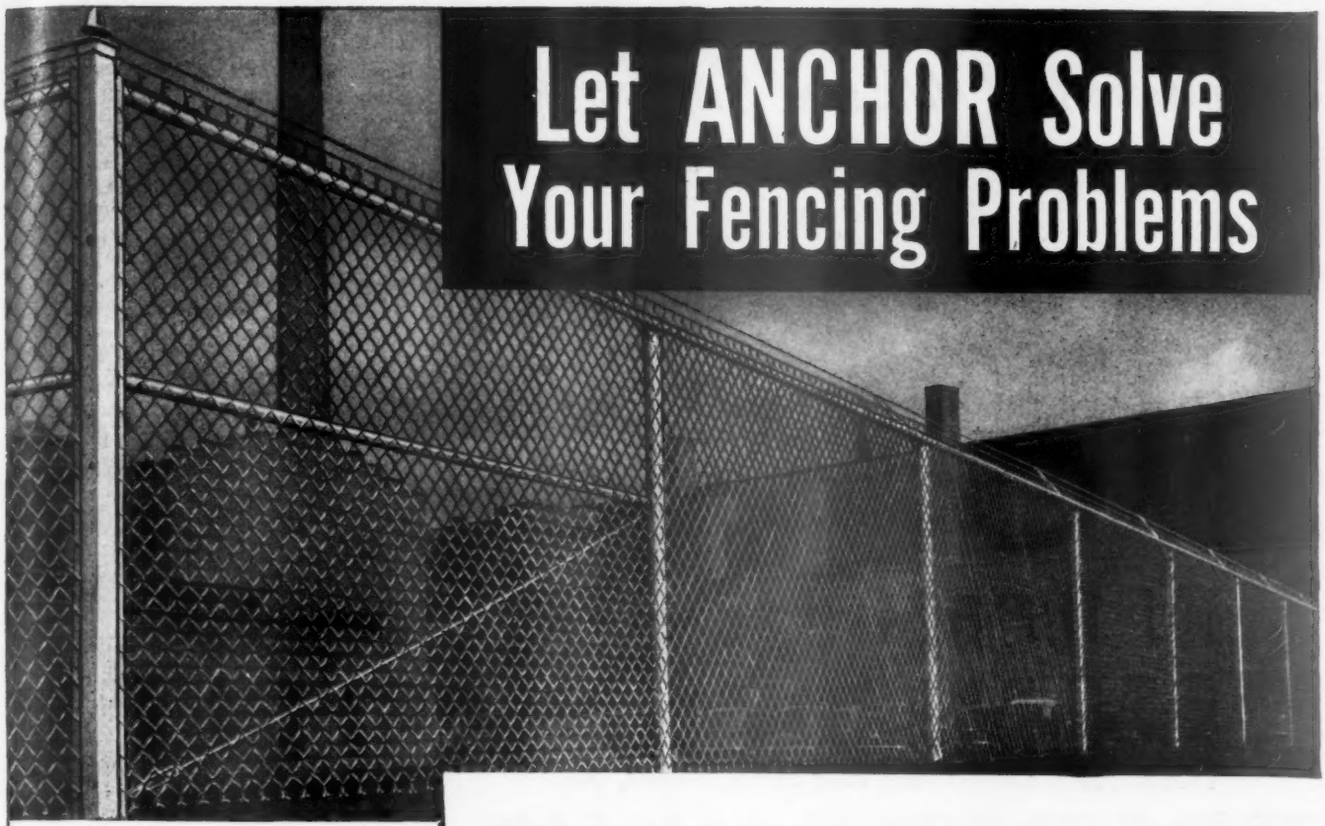
DISCUSS PROPOSED AIRPORT AT SPRINGFIELD

The Springfield (Ohio) Branch of the National Association, pledged their cooperation in the securing of an airport for Springfield, following an enlightening talk on the proposed new project at a recent meeting by Henry Beckley. The association held its annual picnic on July 14 at the Boy Scout Camp near Yellow Spring, Ohio.

PRICE ADVANCES DISCUSSED AT NEW HAVEN MEETING

"It is doubtful whether measures can be taken now that will prevent further price advances," declared A. W. Zelomek, economist, Fairchild Publications, in a talk before the Purchasing Agents Association of Connecticut, at the Union League Club in New Haven. "Drastic measures would be necessary to prevent a postwar advance," he continued. "Dislocations come so fast in a wartime

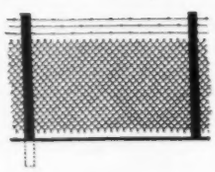
(*Continued on page* 150)

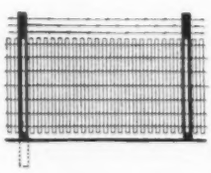


Let ANCHOR Solve Your Fencing Problems

Anchor Makes, Erects, Moves, Repairs Every Type of Fence!

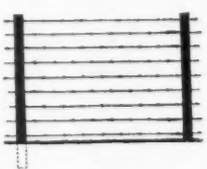
-1- *Chain Link and Barbed Wire on Wood Posts*





-2- *Woven Wood and Barbed Wire on Wood Posts*

-3- *Barbed Wire on Wood Posts*



Anchor Also Makes:

Chain Link Fences
Woven Wood Fences
Barbed Wire Fences
High Board Fences
Indoor Factory Enclosures
Safety Screening Devices
Factory Window Screening
Factory Partitions

NOW, as before, no matter what your fencing problem, count on Anchor to give you the best industrial fencing available. Restrictions make it impossible to obtain standard Anchor Fence (illustrated above) unless your problem deserves special government consideration. Nevertheless, acceptable substitutes (illustrated at left) are still available.

Illustration No. 1 shows Chain Link Fabric of 12-gauge galvanized wire, stapled to wood posts, and with 3 strands of barbed wire stretched on the posts above the fabric. This fence is 7 feet high and provides a highly effective barrier. It is available under the usual priority regulations to the Army, Navy, Maritime Commission and their agents.

Illustration No. 2 shows a woven wood fence on wood posts with 3 strands of barbed wire. There are no restrictions against it, but priorities are necessary.

Illustration No. 3 shows a 7-foot protective fence which is composed of 9 strands of barbed wire stapled to strong wood posts. Priorities are necessary.

Experienced erecting crews operating from Anchor's sixteen branch offices can erect any of the described fences quickly and efficiently. If you require another type of barrier, such as a board fence or concrete wall, or, if you want your present fence moved to a new location, realigned, repaired, or painted, call in our experienced men.

Consult the classified section of your telephone book or write for address of nearest Anchor representative. No obligation. You will get prompt action and discover how Anchor's specialized knowledge can save you time, money and headaches on any fencing problem. Anchor Post Fence Company, 6615 Eastern Avenue, Baltimore-24, Marvland.

ANCHOR FENCE

ON ANY FENCING PROBLEM CALL ANCHOR

Semi-finished Nuts and Cap Screws

OF TRIPLEX QUALITY

Proof of fine quality in any threaded fastener is always found in its performance on the job. Precision manufacture, free running threads, uniform quality and tensile strength determine that performance. Good purchasing agents know this. That is why so many prefer TRIPLEX.

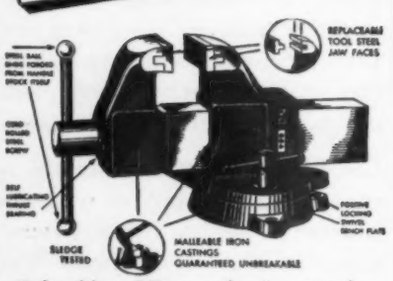
TRIPLEX SCREW COMPANY, 5331 Grant Avenue, Cleveland, Ohio.

TRIPLEX THREADED FASTENERS

CAP AND SET SCREWS · BOLTS, NUTS AND RIVETS

COLUMBIAN VISES

STEP UP BENCH PRODUCTION



Columbian Vises make it easy for your workers to turn out BETTER bench work QUICKER. Columbian Vises are carefully machined to provide positive and accurate work on the most exacting jobs. They also provide additional capacity to take care of the heaviest work. See your Columbian Distributor.

THE COLUMBIAN VISE & MFG. CO.
9029 Bessemer Ave. Cleveland 4, Ohio

A HALF CENTURY PLUS-ONE

1892 1943

51 years of honest service and real old fashioned workmanship in the manufacture of gears.

SIMONDS are known for quality gears. All types — cast and forged — steel, gray iron, bronze; also silent steel, rawhide and bakelite.

Write for information.

Distributors for

RAMSEY Silent Chain Drives and Couplings

THE SIMONDS GEAR & MFG. CO.
25th and Liberty Sts.
PITTSBURGH, PA.

(*Continued from page* 148)

economy that controls are effective only if they are adopted before the appearance of the dislocation whose effects they are supposed to offset. So far, we have been about two steps behind, and the major task of the OWM is to keep us running fast enough so that we will not fall more than three or four steps behind." WPB cut its plants expansion program sometime ago, he observed, and the cancellation or deferment of some military orders will occur more frequently from now on.

ANNUAL BOAT RIDE AT LOUISVILLE

Members of the Purchasing Agents Association of Louisville, Ky., enjoyed their annual boat ride, Tuesday, July 20, as guests of E. J. Theobald on his houseboat the "Eleanor T". A buffet supper was served on the boat.

OFFICIAL ROSTER—NEW YORK ASSN.

(*Continued from page* 142)

nati. In 1926 he joined the Johns-Manville organization in Waukegan, Ill., and in 1937 was transferred to the general purchasing department of the company in New York to assist Frank W. Rowe, General Purchasing Agent. In 1941 he was appointed to succeed Mr. Rowe, now retired from active business.

Vice President Millard W. Merrill has served in that capacity during the past year. After receiving a B. S. degree in chemistry at M. I. T., he commenced his business career with the Chile Exploration Co. in South America. After spending three and a half years in Latin America, he returned to the United States, enlisting in the Chemical Warfare Service in World War I. He has been with the United States Metals Refining Company for 23 years. During the past three years he has served as National Chairman of the Fuel Oil Committee of the National Association, and during the past years he has been chairman of the Forum Committee of the N. Y. association.

Vice President David M. Meeker was also re-elected. In addition to serving as second vice president, he has been chairman of the Association's program Committee. He started his business career during the last War with the Curtis Airplane & Motor Corp., and after the war he was connected with the National Aniline & Chemical Corp. for a period of ten years. Fourteen years ago he joined the Celluloid Corporation in Newark, N. J., of which he became Purchasing Agent, and when that company became affiliated with the Celanese Corporation, he joined the General Purchasing Department of the latter in New York.

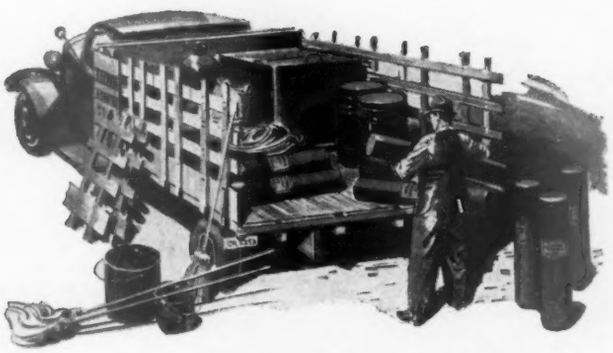
Treasurer E. B. Fielis has served the association in the capacity of treasurer for 21 years. He joined the association in its first year. Until his recent retirement he was Purchasing Agent for the New York & Queens Electric Light & Power Com-

(*Continued on page* 152)

Is the War over . . . . for you?

Roofing

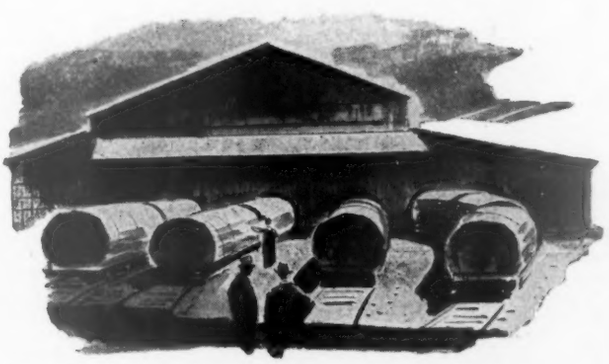
The "heat is off" on many companies which have been rushing out war supplies. America is catching up on wartime building materials. Many a plant has been pretty well "worn out" by the pell-mell rush of the past few years. Maybe your plant needs some long-delayed attention.



Roofing materials are available now, after a long time when they were not. Maybe you should do some roofing work on your plant. Remember that wartime building experience, like peacetime building experience, has shown that the best advice on roofs is "Stick to Coal Tar."

Treated Wood

If you have a roofing or re-roofing job that is held up because you cannot get critical materials for repair or construction of the roof deck, you should consider the use of pressure-treated lumber.



Timber pressure treated with creosote or other preservative materials resists decay and termite attack and is a permanent building material. We shall be glad to quote on requirements for pressure-treated lumber for roofs or buildings.

Koppers Company and Affiliates, Pittsburgh, Pa.

KOPPERS

THE INDUSTRY THAT SERVES ALL INDUSTRY

MILFORD
FLEXIBLE REZISTOR
HACKSAW BLADES
Shatterproof and Unbreakable

ARE NOW MADE WITH IMPROVED HIGH SPEED STEEL

A new method of heat treatment, perfected in our own shops under pressure of war production, now provides more consistent, more uniform cutting life for every MILFORD FLEXIBLE REZISTOR blade. The improved steel we are now using is equal or superior to 18-4-1 High Speed Steel for the toughest jobs.

Fast cutting, shatterproof, and unbreakable under excessive pressures and shocks, it is more than ever the blade for insuring trouble-free production on your automatically fed hacksawing machines. *It will pay you to specify* MILFORD FLEXIBLE REZISTOR *by name.*

Hand Sizes Have Easy-Starting Teeth

THE HENRY G. THOMPSON & SON COMPANY

NEW HAVEN, CONNECTICUT

also manufacturers of Milford Profile Saw . . . THE blade for all contour and profile band saw machines.

(*Continued from page* 150)

pany, a position he held for 21 years. "Through good times and bad, he has kept us pretty close to the budget" says the New York Bulletin, "and has maintained our finances in sound condition". He is a member of the Selective Service Board in his home community.

Board Member Harold Butterfield was one of the early radio "bugs", and in the early days assembled and sold radio sets to neighbors and friends, and was among the first to receive a license to operate an amateur radio station. He entered the profession of purchasing with the Central Stamping Co. in 1917, and in 1927 joined the National Union Radio Corporation as Assistant Purchasing Agent. He is now Director of Purchases for that Company. During the last year he was chairman of the association's entertainment committee.

Board Member J. H. Ewing, who is a graduate of the New York Military Academy at Cornwall, N. Y., became affiliated with the purchasing profession as field Purchasing Agent on construction projects. Later he joined the Purchasing department of the American Radiator & Standard Sanitary Corp., and six years ago he joined the staff of the Calco Chemical Divn. of the American Cyanamid Company. He served as National Chairman of the Chemical and Allied Products Buyers Group of the National Association during the past year.

And Board Member James L. Crosbie has been a member of the association for 16 years. He has been with the Dexter Folder Company for 29 years, and 17 years ago he was appointed Purchasing Agent, with headquarters at the plant in Pearl River, New York. He also is a member of the local Selective Service Board.

Board Member George F. Plate, has been with the Equitable Building Corp. for 28 years, and has been Purchasing Agent for 18 years. He has been a member of the New York Association for 14 years, and among his various activities he has arranged and directed three Members' Products Exhibits for the New York Association, and two Informashows for the National Association when its annual conventions were held in New York in 1935 and 1942.

RATED ORDERS MUST BE IDENTIFIED BY ALLOTMENT NUMBER

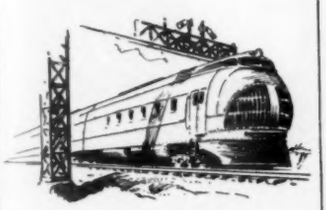
Manufacturers of Class A or Class B products must continue to identify all rated orders for production materials with the allotment number assigned to the related production schedule under the Controlled Materials Plan procedure, the War Production Board announces. This is true despite the fact that allotment numbers on rated orders placed after June 30, 1943, will have no uprating effect.

This was pointed out by Interpretation 3 to CMP Regulation No. 3, and is in accordance with the provision contained in paragraph (f) of the Regulation. The Interpretation makes clear, however, that

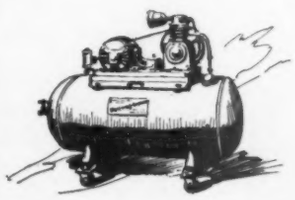
(*Continued on page* 155)

ARE PARTS A PROBLEM?

Consider BRAKE SHOE *as a Source*

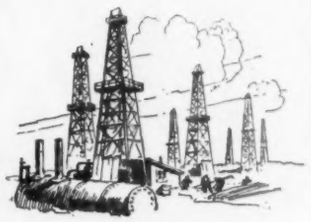


Parts for Trains



Equipment for Garages

Parts for Excavating

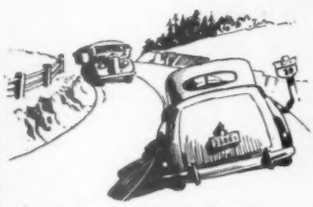


Parts for Oil Drilling

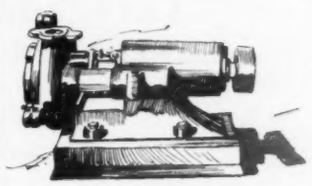
Parts for Planes

Parts in metals, metal alloys and composition.

Parts that are cast, upset, drop forged and molded.



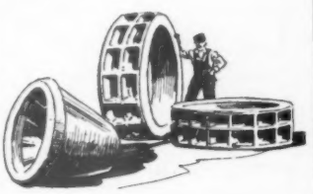
Parts for Cars, Trucks



Industrial Pumps

Parts for Heat Treating

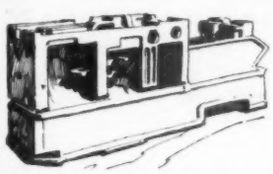
Parts for Ships



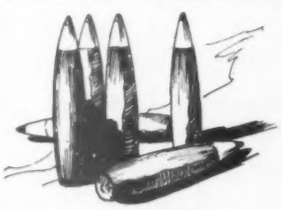
Parts for Crushers

To a manufacturer there just isn't any such thing as an unimportant part, for a piece of equipment is only as good as its weakest part. Knowing this, BRAKE SHOE *engineers* the parts it makes for its customers.

What would closer tolerances in the parts you buy mean in your machine shop costs?

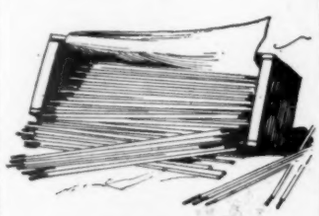


Parts for Machinery



Parts for Shells

Parts for Manufacturers



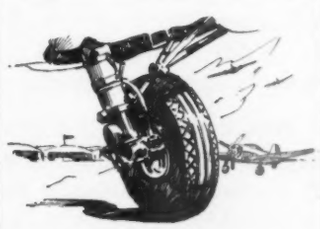
Products for Welding

AMERICAN BRAKE SHOE COMPANY, 230 PARK AVE., NEW YORK 17, N. Y.

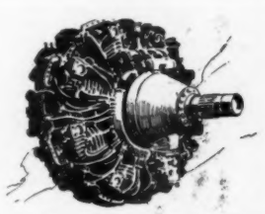
AMERICAN Brake Shoe COMPANY

58 PLANTS SERVING INDUSTRY AND TRANSPORTATION

American Brakeblok Division	Detroit, Mich.
Ramapo Ajax Division	New York, N. Y.
American Manganese Steel Division	Chicago Heights, Ill.
Brake Shoe & Castings Division	New York, N. Y.
Kellogg Division	Rochester, N. Y.
American Forge Division	Chicago, Ill.
Southern Wheel Division	New York, N. Y.
National Bearing Metals Corp.	St. Louis, Mo.



Parts for Landing Gears



Parts for Aircraft Engines

Parts for Tanks

A REAL WORK-MOVING

"Jack-of-all-jobs"

Paul Ehrhardt, Ehrhardt Welding Co., McKeesport, Pa., welds for Victory during the day... teaches welding at night on his Westinghouse All-purpose A-C Welder.

SAYS JOB SHOP OPERATOR OF HIS

A-C WELDER

Like most every other job shop operator, Paul Ehrhardt is swamped with jobs he never did before. Things people used to throw away, he now welds for further service . . . tractor cleats, sprockets, gears, housings, levers, lawn mower parts, etc. In addition, he fabricates parts for war industry, and at night teaches welding . . . a schedule that leaves no leeway for gadget-fussing or time out for maintenance. For that kind of service he switched to a-c welding.

From his Westinghouse All-purpose A-C Welder he gets the speed he needs—20% to 30% faster welding. He has no arc blow or maintenance to contend with, and he can turn out consistently better welds. Add to that, ample capacity for all types of job shop work, lower first and operating costs, simplicity of control, availability, and you have Mr. Ehrhardt's reasons for selecting the Westinghouse A-C Welder.

Before adding to or replacing present equipment in your shop, look into Westinghouse A-C Welders. Ask your Westinghouse Distributor or write for A-C Welding Booklet B-3136, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N.

J-21279

Westinghouse

PLANTS IN 25 CITIES... OFFICES EVERYWHERE

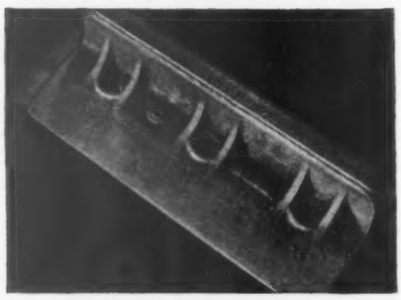
A-C WELDERS

EXAMPLE:

FABRICATES war products... makes vacuum-tight welds on housings for vacuum systems using Westinghouse DH and SW electrodes.

EXAMPLE:

MAINTAINS vital equipment. Hard-facing tractor cleats with Westinghouse Hardentough electrodes lengthens cleat life 3 to 5 times.



EXAMPLE:

REPAIRS cast steel bulldozer drive sprockets. Break was burned out, pre-heated and welded with Westinghouse FP electrodes.

(*Continued from page* 152)

a dealer, jobber, or distributor who receives a rated order with an allotment number or symbol for a product or non-controlled material for which he has re-received no authorized production schedule is not required to show the allotment number or symbol on his customer's order in extending the rating.

Background: Prior to the amendment of CMP Regulation No. 3 on May 14, a preference rating accompanied by an allotment number gave the order to which it was applied a higher priority than a mere preference rating of the same numerical value. For example, an AA-1 rating accompanied by an allotment number would take precedence over an order merely rated AA-1. This uprating effect was eliminated by the May 14 Amendment.

★ ★ ★

PD-200 REPLACED BY WPB-617

Form PD-200, the form used to make application for authority to begin construction and for priority assistance, has been replaced by a new form known as WPB-617, the War Production Board announces.

In addition to the functions performed by the old PD-200 forms, the new WPB-617 constitutes an application for allotment of controlled materials. In order to prevent confusion over use of the forms, since all builders were familiar with PD-200, the new form will carry a notation indicating it replaces PD-200.

Beside combining all functions on one form, WPB-617 will have several other advantages over the old form. It will be smaller letter-size—and will fit standard typewriters and files.

Under the Controlled Materials Plan, any person who made application for authority to begin construction and for priority assistance on Form PD-200, and whose application was approved, was required to file additional forms for controlled materials. When WPB-617 comes into use July 1, the filming of these additional forms will no longer be necessary, since controlled materials will be alloted simultaneously with the granting of authority to begin construction. The authorization form will be CMPL-224, which combines the functions of the P-19 series of orders and forms CMP-4C.

The new WPB-617 form may be used prior to July 1, but must be used after that date. It has been distributed to all field offices and is now being issued to builders. Prospective applicants are urged to destroy all copies of PD-200 forms and replenish their stocks with WPB-617.

★ ★ ★

NEW RULING ON PREFERENCE RATING

A preference rating assigned with an advance allotment of controlled materials used on orders placed prior to May 16 does not have to be changed even though a rating assigned with the third quarter allotment may be lower.

Direction No. 14 to CMP Regulation No. 1, issued by the War Production Board, rules that downrating in such cases is not compulsory. This ruling is similar to the one eliminating the downrating requirement in connection with maintenance, repair and operating supplies orders placed prior to May 16, which were downrated by the May 14 amendment to CMP Regulation No. 5

Generally, when a preference rating assigned for the purchase of certain materials has been changed, uncompleted orders are rerated accordingly, effective the date the rating was changed, as provided under Priorities Regulation No. 12.

In accordance with this direction, if a rating assigned with a third quarter allotment is lower than a rating assigned with an advance allotment, uncompleted orders shall be downrated only if they were placed after May 16.

★ ★ ★

KEEPING RECORDS OF MRO SUPPLIES

Records of maintenance, repair and operating supplies may be kept on the basis of supplies received, rather than the amoounts ordered in any quarter, the War Production Board announces.

Although quantity restrictions under CMP Regulation No. 5 are on an "order" basis, if a person prefers to compute his expenditures on a "receipt" basis, he may do so, according to Direction 8 issued today. However, the use of one method for part of the supplies and another method for the rest is not permissible.

Direction No. 8 to CMP Regulation No. 5.

★ ★ ★

ISSUE NEW CMP CLASS B PRODUCT LIST

A revised Official CMP Class B Product List, including a Class A Civilian Type End Product List, has been issued by the War Production Board. This List supersedes the earlier Class B Product List published December 21, 1942.

The List is substantially the same as the December 21 List, but incorporates the following changes: (1) Air-borne Special B products have been deleted; (2) the previously carried partial list of maintenance and repair items has been eliminated; (3) a new category of Class A Civilian Type End Products has been established.

In some instances, with respect to specific products within each classification, definitions and interpretations have been listed. These are intended to clarify the scope of product groups to aid manufacturers in classifying their products.

Regional Offices of WPB have been provided with definitive lists in order that manufacturers who have questions as to whether or not their product is included in one of the broad categories in the Class B List may refer their problem to the Regional Office.

Civilian Type End Products are those for the manufacture of which procuring Claimant Agencies hold contracts with prime consumers, as defined in CMP, and for which the Agencies may elect to allot controlled materials directly. In such a case, the Claimant Agency will notify the prime consumer to submit applications directly to it on Form CMP-4A for con-

(*Continued on page* 156)

WESTINGHOUSE WELDERS FOR JOB SHOP WORK

FOR SHOP MAINTENANCE AND LIGHT WORK

Model WT-1C—100 amperes. Current range, 20 to 140 amperes. Built-in capacitor (optional). Built-in breaker protection. Easy to move.

ALL-PURPOSE WELDER

Model WT-4C—200 amperes. 27-step current adjustment from 20 to 250 amperes permits using wide variety of electrodes. Built-in capacitor (optional) and Nofuze "De-ion" Circuit Breaker.

NEW D-C WELDER WITH ARCONTROL

Single, pre-set current adjustment. Lots of capacity to handle all kinds of work. No drop-off after warming up. Simple adjustments. 200, 300 and 400-ampere models.

COMPLETE LINE OF WELDING ELECTRODES

Westinghouse electrodes are designed for fast production of high-quality welds with a-c or d-c on carbon steels, cast iron, stainless and alloy steels, sheet metal and special applications. Strike easily and have high deposition efficiency.

★ ★ ★

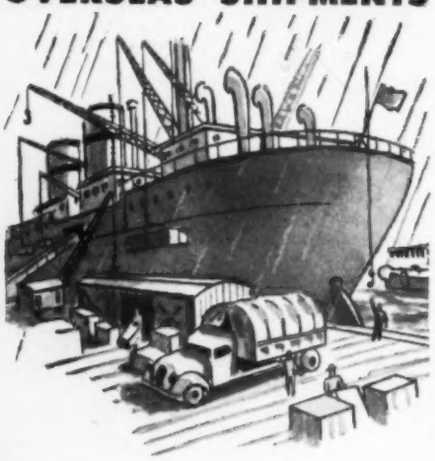
Write for latest a-c and d-c welding literature. Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N. J-21279

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

WELDERS

SEAL
WATERPROOF CONTAINERS
with
SOLSEAL
WATERPROOF TAPE
for
OVERSEAS SHIPMENTS



OF INTEREST TO EVERY EXPORT SHIPPER is this newly perfected water-resistant tape. Its objective—to seal or strap the new waterproof or moisture-resistant containers specified for overseas shipments.

SOLSEAL Tape is available in 30/30/30, 60/30/30 and 60 lb. Wet Strength kraft with Solseal adhesive. Also available string-filled for use as a strapping tape.

Multiple tests have proven that the tape adheres to the container for *over eight weeks* after immersion. Under conditions of high humidity, rain and actual immersion this type answers a real need. Write for free sample coil with solvent for testing purposes. Specify type of SOLSEAL sample desired.

McLAURIN-JONES CO.
BROOKFIELD, MASS.
OFFICES: NEW YORK • CHICAGO • LOS ANGELES

(*Continued from page* 155)

trolled materials required to cover the Agency's authorized production schedules. In the absence of such notification from a procuring Claimant Agency, prime consumers manufacturing the specified products must apply for controlled materials and authorized production schedules to WPB on Form CMP-4B.

Copies of the Official CMP Class B Product List and Class A Civilian Type End Product List are available in War Production Board Field Offices.

FORM PD-3A REMAINS IN USE

Form PD-3A, preference rating instrument used by the Army, Navy, Maritime Commission and other government agencies, remains in use though its indicated expiration date is June 30, the War Production Board announces. The Bureau of the Budget has approved continued use of the form for an indefinite length of time.

Although the form currently bears the June 30, expiration date, it will not be reprinted for the time being. There is a considerable stock of PD-3A's still on hand. The present form will be valid until the supply has been exhausted.

MRO RULING ON REPLACEMENT MOTORS

The sale of a fractional horsepower motor to replace one broken down is considered a maintenance and repair transaction, where the broken one is taken in by the repairer.

This transaction, according to an Interpretation issued today by the War Production Board, comes within the exemption provided by Order L-123, covering the delivery of maintenance and repair parts.

PLANT LIGHTING GUIDE BASIS OF PRIORITY ASSISTANCE

Engineers, architects and building consultants are advised by the Conservation Division of the War Production Board to check all lighting specifications for construction or conversion projects which are now being drawn up, to make sure that they comply with the policy outlined in the "Design Guide for Interior Electric Lighting and Wiring for Wartime Construction" which has been released this week.

Prepared by the Conservation Division, the Guide, although not an official order or directive of WPB, presents the conservation policy followed by WPB when considering applications for priority assistance to obtain fixtures and other materials required in lighting installations.

"REGULARLY ESTABLISHED PRICES" CANNOT BE HIGHER THAN CEILING

"Regularly established prices", as the term is used in Priorities Regulation No. 1, cannot be regarded as higher than the ceiling prices established by the Office of Price Administration, according to a

(*Continued on page* 158)

ARMSTRONG-BRAY
STEELGRIP
FLEXIBLE BELT LACING

Prompt Delivery!
—on both standard types of belt lacing.

STEELGRIP that is applied with a hammer that penetrates belting easily and clinches securely to make a strong, flexible smooth joint. 2-piece hinged rocker pins take up wear. In boxes or long lengths for wide belts, it compresses belt ends and prevents fraying, 8 sizes.

WIREGRIP BELT HOOKS

Applied with any standard make lacing machine, these belt hooks come on double (patented) aligning cards that hold hooks in perfect alignment and prevent card end waste. 6 sizes.

ARMSTRONG-BRAY & CO.
"The Belt Lacing People"
5378 Northwest Highway Chicago, U.S.A.

FOR TOUGH STAMPING JOBS
Use
SAFETY
(Reg. Trade Mark)
Wedge Grip

LETTERS AND FIGURES

- Deeper impression with less exertion
- Will not spall, will not mushroom
- 25% to 50% more service
- Any size character from 1/16" to 1"

WRITE FOR LITERATURE

M.E. CUNNINGHAM CO.
SAFETY STEEL STAMPS
154 E. Carson St.
Pittsburgh, Pa.

POWER WILL WIN THE WAR
—don't waste it!

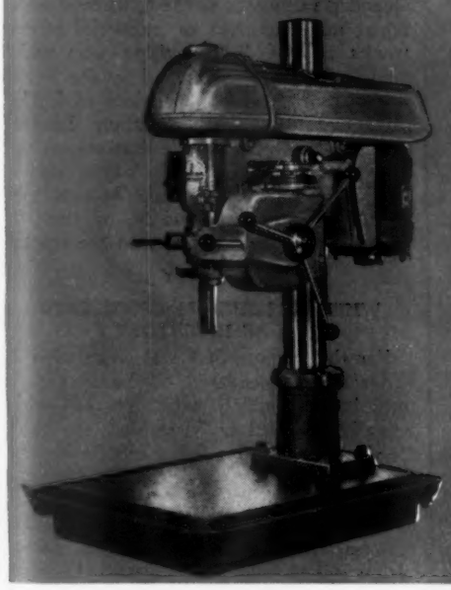
IF your shop is drilling up to ¾" in steel and is using heavy drill presses or radial machines with five horsepower motors, or larger, you are wasting power.

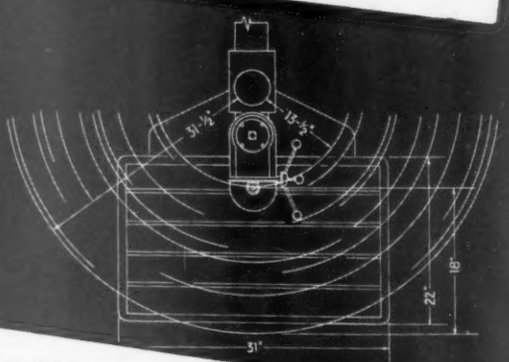
WALKER-TURNER RADIAL DRILLS (right) or 20" DRILL PRESSES (below) will do such work faster and better and use only ½ or ¾ horsepower motors to do it. Don't waste power today (or tomorrow). Study the specifications of these up-to-the-minute, streamlined Walker-Turner Machine Tools and then send for our new catalog.

WALKER-TURNER COMPANY, Inc.
Berckman Street, Plainfield, N. J.

Walker-Turner Radial Drill

Spindle Speeds: 160-8300 r.p.m.
Motor: ½ horsepower
Overall Dimensions: Ht. 68½"; Width 31"; Depth 58"
Shipping Weight: 450 lbs.
(Drawing below indicates wide working range of the Walker-Turner Radial Drill)





Walker-Turner 20" Drill Press

Bench and Floor Models — Single or Multi-Spindle — with or without Power Feed. Spindle Speeds 260-5200 r.p.m. Weight 472 lbs.

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COMPANY, Inc.
PLAINFIELD, N.J.
U.S.A.

MACHINE TOOLS

DRILL PRESSES — HAND AND POWER FEED • RADIAL DRILLS
METAL-CUTTING BAND SAWS • POLISHING LATHES • FLEXIBLE SHAFT MACHINES
RADIAL CUT-OFF MACHINES FOR METAL • MOTORS • BELT & DISC SURFACERS

STARRETT TOOLS

Helping to Give the AIRACOBRA *Its Sting!*

These scenes in the plant of the Bell Aircraft Corporation give some idea of the wide range of precision measuring and inspecting work being performed by eager hands with the sureness and swiftness that tools of Starrett quality and workmanship contribute to the job.

You may be certain that the makers and distributors of Starrett Tools will keep on doing their utmost to provide the tools needed to finish the job.

THE L. S. STARRETT CO., ATHOL, MASSACHUSETTS, U. S. A.

World's Greatest Toolmakers

STARRETT

PRECISION TOOLS • DIAL INDICATORS • GROUND FLAT STOCK
HACKSAWS • METAL CUTTING BANDSAWS • STEEL TAPES

(Continued from page 156)

ruling announced by the War Production Board.

This interpretation of Regulation No. 1 means that a manufacturer or other vendor may not reject an order bearing a preference rating on the ground that the price offered is below the regularly established price, if the purchaser meets the OPA ceiling.

MINERAL WOOL STANDARD

Division of Trade Standards, Natural Bureau of Standards, Washington, D. C. announces release of Commercial Standard CS 105-43, "Mineral Wool; Loose, Granulated, or Felted Form, In Low-Temperature Installations." Copies may be procured from the Superintendent of Documents, U. S. Government Printing Office, Washington, D. C. at 5¢ each.

INDUSTRIAL POWER TRUCK ORDERS MUST BE OK'd BY WPB

Purchase orders for used industrial power trucks must be authorized by the War Production Board before they can be accepted, in accordance with an amended Limitation Order L-112 issued recently.

Authorizations of acceptance are made on Form WPB-1319 (formerly PD-556).

Industrial power trucks are self-propelled vehicles designed primarily for handling material on floors or paved surfaces in and around industrial plants, depots, docks, airports, etc.

Supplementary to L-112, the War Production Board also announced an amended version of L-112-a, naming additional manufacturers of industrial power trucks on the list of those who make models which are approved by the WPB and come within the provisions of L-112.

The amended Supplementary Limitation Order also places limitations on the specifications applied to fork-type models of industrial power trucks. The new specifications limit the height of the lift and the length of the forks on the trucks.

WHEN MATERIAL IS CONSIDERED TO BE INVENTORY

For the purpose of CMP Regulation 2, material is considered to be inventory until it is actually put into process or is actually installed or assembled, the War Production Board pointed out in issuing Interpretation No. 1 to the Regulation. The Regulation prohibits the acceptance of delivery of any item of controlled material if the user's inventory is, or by virtue of such acceptance will become, greater than the maximum prescribed.

Thus, the Interpretation states, putting into process does not include minor initial operations, such as painting, and does not include any shearing, cutting, trimming or other operations unless such initial actions are part of a continuous fabrication or assembling operation. Nor does it include inspection, testing and ageing, nor segregation or earmarking for a specific job or operation.

(Continued on page 162)

How the Right Kind of Lighting Helps Improve Production

Laboratory Findings: ①	*Industry Experience:* ①
LIGHT ACTS AS MAGNIFIER Ability to see small details increases as illumination is increased. Light is a magnifier of small detail. (page 14)	**IMPROVED ACCURACY OF WORKMANSHIP** A manufacturer of *heavy aircraft parts* reports inspection more efficient and production increased when lighting was improved (to 40-50 footcandles). Tool marks were easily seen and file marks revealed under the new lighting. (Case No. 79)
ELIMINATION OF GLARE When a glare source was located within 5 degrees of the line of vision, 84% of the light on the test object was wasted due to the presence of the glare source. (page 15)	**LESS SPOILAGE** A roller bearing manufacturer states that since lighting was improved (level raised from 15 to 45 footcandles), grinder operators spot improper grinder performance more quickly and can correct this before the work is spoiled. (Case No. 8)
FASTER SEEING It takes time to see. Tests show that as illumination is increased from 1 to 100 footcandles, speed of seeing is practically doubled. (page 16)	**INCREASED PRODUCTION** A valve manufacturer finds his men can read verniers more quickly with better lighting. Resultant over-all increase in production was 25%. (Case No. 30)
GREATER EASE OF SEEING Better illumination aids the individual in performing visual tasks. In one series of comprehensive tests, those with better eyes were aided 14% by better lighting while those with most deficient eyes were aided 22%. (page 17)	**LESS FATIGUE** A manufacturer of intricate aluminum castings reports that his workers were less tired at the end of the day with new lighting (35 to over 60 footcandles), with higher values at final inspection benches. (Case No. 20)

① *Data Source: "Value of Good Lighting in War Production," a report issued by the Illuminating Engineering Society.*

Helping War Plant Personnel to

IMPROVE PRODUCTION

is an Important Part of YOUR WAR TASK

② *See Benjamin booklet: "Benjamin Specificaticns for Productive Lighting in War Plants". Also American Recommended Practice of Industrial Lighting" approved by the American Standards Association.*

Securing the improved production and all the other benefits of good lighting depends upon your making certain that the right kind of lighting is being provided for every operation in your plant.

What is the "Right Kind of Lighting"?

The basis of all good lighting is enough light—25 to 50 foot candles or more—depending upon the seeing task performed by your employees. In addition, such lighting must be properly directed and diffused as well as uniformly distributed over the working area.

However, most of the benefits from such good lighting are lost unless provisions are made to reduce direct and reflected glare to the minimum by the use of properly designed and installed lighting equipment.

Such lighting equipment also must be designed to provide maximum assurance against lighting failure, provide maximum light output consistent with proper shielding and operate at a minimum of maintenance trouble and expense. ②

Free Lighting Guide

In the Benjamin booklet: "Specifications for Productive Lighting in War Plants," is contained complete, concise information on how to obtain the right kind of lighting in your plant. Also data relative to the importance of reflector design and rigid Benjamin standards for mechanical strength which Benjamin, through 40 years of experience, has found to be essential for industrial lighting. A copy of this guide will be sent to you without cost or obligation. Simply write the Product Information Department Y, Benjamin Electric Mfg. Co., Des Plaines, Illinois.

BENJAMIN TRADE MARK

Lighting Equipment

Enlarged reproduction free on request

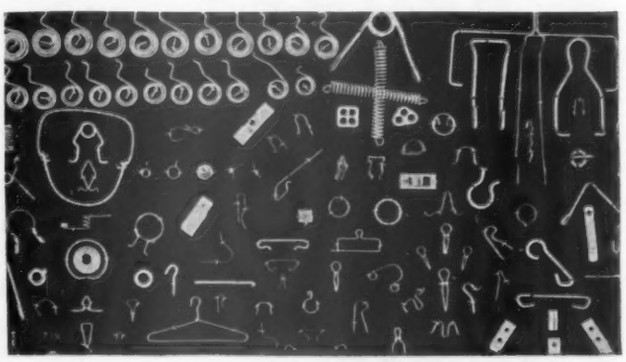
Fighting Springs . . . Our Specialty

Whatever you are producing to help defeat the Nazis and Japs, Wissco springs and wire forms want to help. Practically every product of American industry *needs* them . . . and now more than ever is it vital that they be tops in courage and stamina.

That's where Wissco fits. For 122 years we have specialized in quality wire products, until craftsmanship has become a tradition here. To protect our world-famous name we start with steels made with exacting care in our own blast furnaces. Each succeeding step in drawing, forming, tempering and testing is skillfully followed in our own mills.

Right now springs and wire forms that originated in our furnaces are serving in practically every weapon of war used by *our* sons and brothers and *yours*, out on the fighting fronts. We're eager to give them more and more help . . . and fast!

Write for our free book, "Springs and Wire Forms," containing formulae and tables of value to engineers. And for fast quotations, send us your specifications and priority ratings. Wickwire Spencer Steel Company, 500 Fifth Avenue, New York, N. Y.

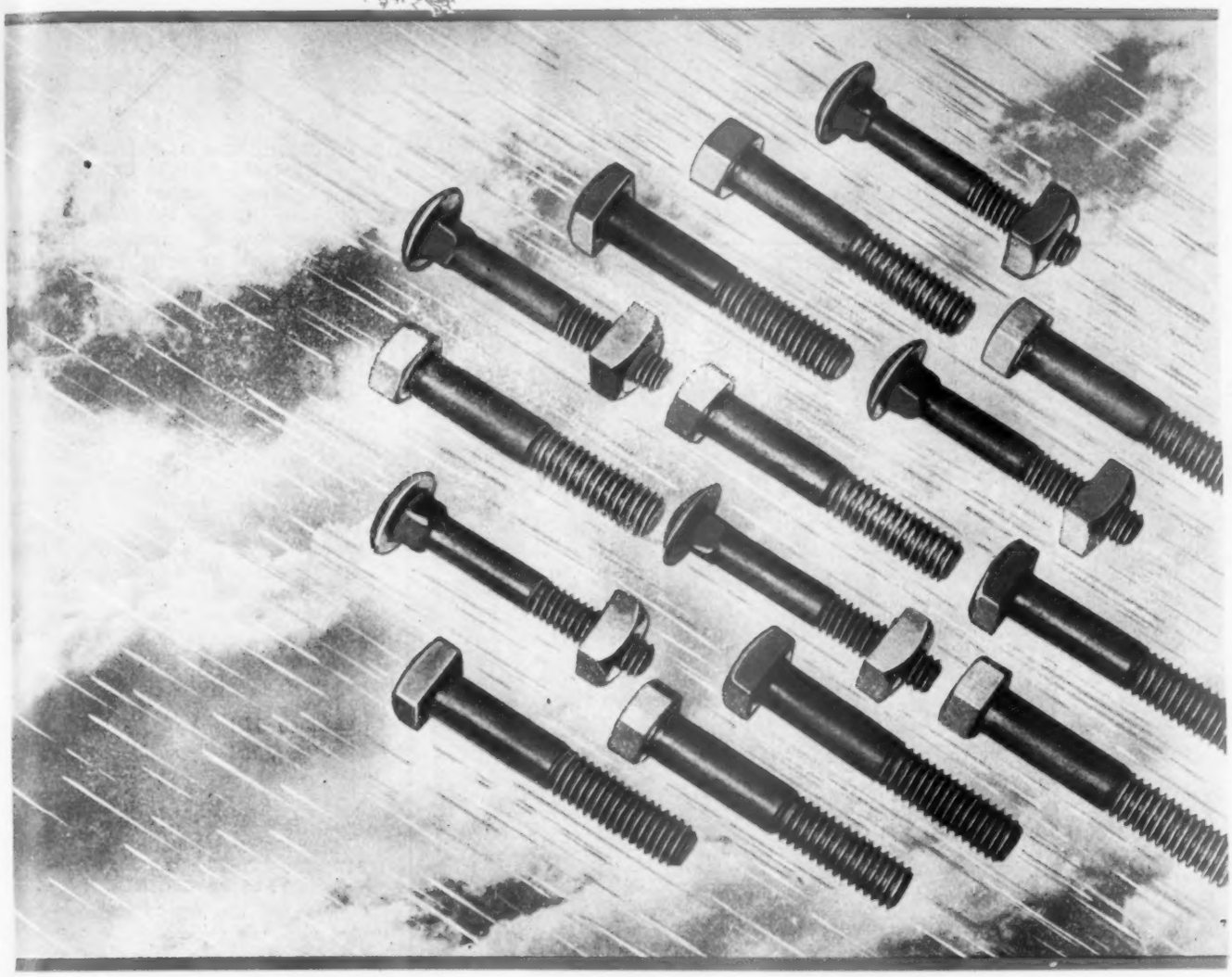


It would take an encyclopedia to list and picture *all* of the springs and wire forms of every kind and description we produce. They range from ones you need a magnifying glass to see, to big brutes for heavy jobs. Tell us what *you* need—then learn first hand about Wissco service and satisfaction.

SEND YOUR SPRING QUESTIONS TO

WICKWIRE SPENCER STEEL COMPANY

STANDS FOR FRIENDLINESS



REIGN of STEEL . . .

THREE-TO-ONE OVER THE AXIS, is America's present record of mechanized war equipment production . . . and the ratio is being increased hourly!

Now softening the enemy on every front . . . American steel will wear the Victor's Crown!

In the Reign of Steel, million upon millions of Wasmer Tru-Fit Bolts and Screw Fasteners are being used for vital war production and equipment . . . meeting rigid Army and Navy specifications . . . providing the largest production . . . the most accurate, precision threads . . . the toughest and the most durable steel fasteners in the history of the Wasmer organization.

WASMER
BOLT & SCREW CORP.

13600 ATHENS AVE., CLEVELAND, OHIO, U. S. A.

(*Continued from page* 158)

For example, if a manufacturer who uses wire or rod cuts a sufficient quantity of it to length at once to maintain his operations for a considerable time, the cut pieces remain as inventory until processed into another form or until assembled or installed.

Also, if a manufacturer purchases and stores steel castings in the form purchased, and the steel castings are not put into process when painted and stored, the inventory includes those painted and stored. Likewise, if a manufacturer shears steel and stocks it in sheared form, such stock is still a part of his inventory if the material does not continue into production.

SPECIAL DELIVERY CHARGES MAY BE PASSED ON TO BUYERS

Warehousemen and jobbers on sales of iron and steel products when the buyer has specified special delivery service may pass on to the buyer actual special delivery service charges less than normal freight from shipping point to destination, the Office of Price Administration announced recently.

Special delivery-services are defined as shipments by railway express, air express or parcel post.

If the special delivery service charge is cheaper than normal freight, however, the difference between the special delivery charge and normal freight must be deducted from the maximum delivered price for the shipment.

This change in computing transportation charges is made in Amendment No. 17 to Revised Price Schedule No. 49 (Resale of Iron and Steel Products), and became effective July 20, 1943.

The change formalizes an interpretation of the schedule issued some time ago by OPA, stating it was the intent of the Schedule that special delivery charges thus could be passed on.

SUBSTITUTION OF ALLOTMENT NUMBERS ON CM ORDERS

One allotment number may be substituted for another allotment number on an authorized controlled material order which has been placed with a mill, without changing the position of the order in the mill schedule, the War Production Board announces.

In such a case, the order will be treated just as though it bore the substituted allotment number when the order was originally placed, according to Interpretation No. 10 to CMP Regulation No. 1.

It is pointed out that if at the time the allotment symbol is substituted the order itself is otherwise materially changed, the order is to be treated as a new order. Changes which would constitute a new order include the following: (1) a change in the form or shape of the product ordered, (2) advancing the delivery date, or (3) an increase in the quantity ordered.

The interpretation emphasizes that a person substituting one allotment number for another must have an allotment, identified by the substituted number, to support the order.

REPLACEMENT ORDERS FOR REJECTED CONTROLLED MATERIALS TAKE PRECEDENCE

Orders for the replacement of controlled materials rejected by a customer because of nonconformity with specifications take precedence over all other orders, the War Production Board has ruled.

Aluminum producers shall fill such replacement orders in preference to all other orders not in actual production on the day the replacement order is received. In the case of steel and copper producers, this ruling applies in the absence of specific instructions to the contrary from the Steel and Copper Divisions.

Controlled materials producers are instructed by Direction 16 to CMP Regulation No. 1 to replace the defective material without requiring the extension of an additional allotment, and the customer is not required to charge the replacement material against an allotment, even if the replacement is made in a subsequent quarter.

In all cases, such replacements are not restricted by the provisions of paragraph (t) (4) and (5) which require that no authorized controlled material orders may be shipped if they are not filled within 30 days after the scheduled delivery date

(*Continued on page* 164)

● *Transmission gear cover—a Forest City casting used by a large automotive manufacturer.*

FOREST CITY has two efficient, modern foundries—both equipped to produce precision castings on schedule and as specified.

We can supply machine tool castings, such as gear boxes, drill press heads, gear box covers and housings in gray iron, semi-steel or high test semi-steel in sizes from a ½ ounce to a half ton.

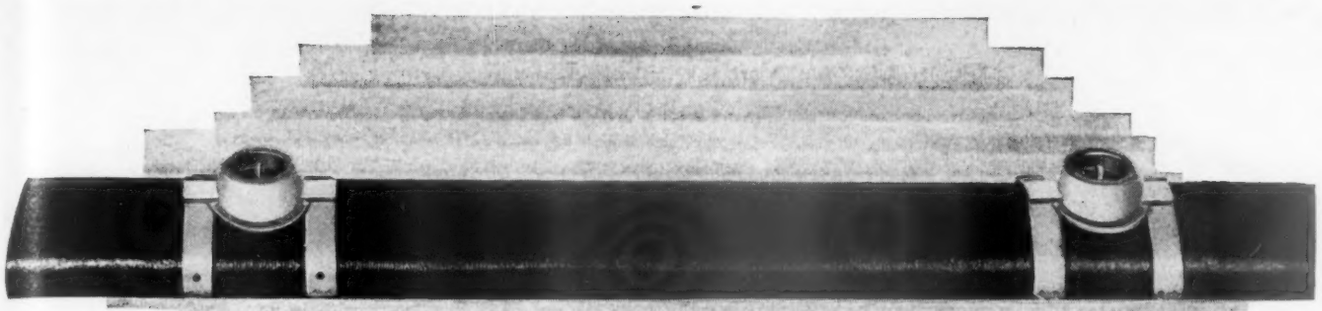
Send us your inquiries or ask for a representative to discuss your casting requirements.

Gray Iron, Semi-Steel and High Test Semi-Steel Castings

PHONE PROSPECT 5040

THE FOREST CITY FOUNDRIES CO.

2500 WEST 27th ST. • CLEVELAND, OHIO



G-E FIBERDUCT FOR UNDERFLOOR POWER DISTRIBUTION

Here is an underfloor raceway that will make power available for wartime needs. Use G-E Fiberduct in factories, machine shops, aircraft hangars and office buildings. You'll like the flexibility it gives. Inserts for outlets can be preset at the factory, or set when the Fiberduct is installed, or set at any later time.

G-E Fiberduct is made of non-corrodible, impregnated fiber and is moisture resistant and high in mechanical strength. Ducts can be used to carry power lines, lighting circuits, telephone lines or signal systems. The interior of the duct is smooth so that wire pulling is easy.

G-E FIBERDUCT BOXES, FITTINGS AND OUTLETS

A full line of boxes and fittings are available for easy installation of G-E Fiberduct including single-, double- and triple-duct boxes, couplings, supports, elbows, etc. Outlets include cable risers and plastic-covered telephone and convenience outlets.

FOR FURTHER INFORMATION about G-E Fiberduct underfloor raceways and G-E Fiberduct boxes, fittings and outlets, see the nearest G-E Merchandise Distributor or mail the coupon for a catalog.

General Electric Co.
Section CDW-836-77
Appliance and Merchandise Dept.
Bridgeport, Conn.
Sirs: Please send me the G-E Fiberduct Catalog.

Name .....

Address .....

City ..... State .....

GENERAL ELECTRIC

Tannate BELTING

gives you more production from present machines

• In thousands of important places, TANNATE leather belting is helping to increase the production of present equipment. The unusual strength of TANNATE and its firm pulley grip keep machines running smoothly at full capacity even under varying load conditions. It resists heat, oil, moisture and many weak chemicals better than oak tanned leather. TANNATE has plenty of endurance for three shift, seven day a week operation. And it requires little maintenance other than an occasional treatment with BeltPreserver.

Let TANNATE help you keep all your machines running at full capacity. It will increase your output and reduce production costs.

Write for a free belt length calculator. Figures belt length quickly and accurately.

RHOADS Tannate WATERSHED LEATHER BELTING

J. E. RHOADS & SONS • Established 1702

35 NORTH SIXTH STREET, PHILADELPHIA 6, PA.

NEW YORK • CHICAGO • ATLANTA • CLEVELAND

HOTEL PHILADELPHIAN

FORMERLY HOTEL PENNSYLVANIA

DANIEL CRAWFORD, JR., Mgr.

39th and CHESTNUT STREETS

PHILADELPHIA, PENNSYLVANIA

Our courteous and competent staff will give you the utmost in friendliness, comfort and service. Conveniently located to all stations, and only five minutes away from the heart of the business section.

600 ROOMS

Each with bath from $3.00 up

RADIO IN EVERY ROOM

Lounge and Restaurants

Unrestricted Parking to 3 a.m.

Believe it or Not—

PERMAG Cleaning Compounds

— are highly important to industries today, whenever a cleaning job is to be done.

— have been removing grease, oil, dirt, foreign particles from metal prior to finishing for 20 years.

— help keep plant maintenance at a high level.

— over 300 formulas used successfully where special cleaners are required. There's a PERMAG Cleaning Compound for every job.

We help industries solve their tough problems. Our Cooperative Service is ready to work out the difficulty. Write or 'phone.

MAGNUSON PRODUCTS CORPORATION

Mfrs. of Specialized Scientific Cleaning Compounds for Industries

Main Office 50 Court St., Brooklyn, N. Y.

In Canada: Canadian Permag Products, Ltd. Montreal and Toronto

(*Continued from page* 162)

and a report made to the appropriate Controlled Materials Division. However, if steel producers cannot make delivery of the replacement order in time to meet the delivery requirements of the customer, they must immediately notify the chief of the appropriate Product Section of the Steel Division, in writing, giving a detailed explanation. If defective copper cannot be replaced in time to meet an authorized production schedule, or the delivery requirements of the customer, the producer must immediately notify the Copper Division in writing, giving all details.

Instructions for the disposition of rejected steel, copper and aluminum vary in some respects. The steel producer should attempt to make other use of the material to the extent permitted by applicable War Production Board regulations and orders. If this is not possible, he should attempt to find other suitable uses and submit the proposed disposition to the appropriate Product Section of the Steel Division for approval.

Copper and aluminum rejections must be reported to the producer by the customer immediately. If the material is not scrap, the producer may direct that the material either be returned to him or shipped to another customer to fill any order which the producer is permitted to fill with new material under applicable regulations and directions.

Copper scrap may not be disposed of except as provided by Order M-9-b. Aluminum scrap is handled in accordance with the provisions of Order M-1-d.

WELDING ROD RULING

Welding rod used for manufacturing purposes may not be treated as an operating supply under CMP, the War Production Board announced today, even though it is carried as an operating supply under the manufacturer's established accounting practice.

This ruling is contained in Direction No. 7 to CMP Regulation No. 5, which says that welding rod includes both arc welding electrodes and gas welding rods.

The Direction states that a manufacturer may use ratings assigned to him by CMP Regulation No. 5 for MRO, to obtain his requirements of such rod to repair his own equipment. However, such ratings may not be used to get welding rod for welding operations in the production of a product.

MAXIMUM PRICES SET BY OPA ON TIGHT COOPERAGE

"Tight" wooden barrels and the wooden parts used in their manufacture have been provided with specific dollars-and-cents maximum prices by the Office of Price Administration.

The principal parts for which maximum prices are established are staves, heads and dowels.

The new maximums are contained in Maximum Price Regulation No. 424 (Tight Cooperage Stock and Sawed Tight Cooperage), and are retroactive to April 3, 1943.

For Tapping brass, bronze, aluminum, plastics, cast iron or steel — the wide range of Winter Brothers precision-built taps will insure top production results — rapidly and accurately.

The Winter Tap Data booklet offers some practical suggestions in selecting the proper taps to use in these materials — and THE RIGHT TAP IS IMPORTANT in producing smooth-finish threads. Send for your copy today.

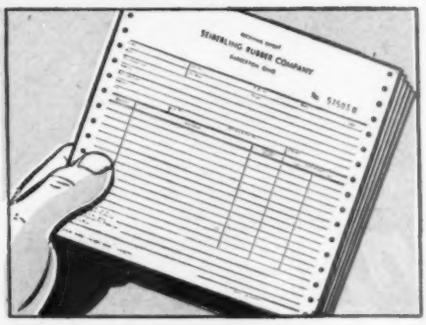
Always specify the material in which taps are to be used, so we can help you do your thread cutting quicker and better.

A Division of
THE NATIONAL TWIST DRILL & TOOL CO.
DETROIT, MICHIGAN

Winter Brothers
COMPANY Wrentham, Massachusetts, U.S.A.

"Today's production battles can be won or lost RIGHT HERE!"

RECEIVING is the first actual step in production progress—when schedules hinge on needed materials or parts. Today, MORE incoming shipments, LATE shipments and PARTIAL shipments are burdening production with delays, confusion, errors and bottlenecked materials—unless the following essential elements *are present* in an adequate system of control . . .



SPEED: An efficient Receiving Report system permits checking and moving of incoming materials immediately. In typical Standard Systems, the original record speedily written on the spot is the final report; rewriting is eliminated and materials do not await transcribing of accumulated records before they can move to the department which requisitioned them.

INFORMATION: *Complete* information required by given circumstances, is provided for on a properly designed Receiving Report. Such a system will establish a definite routine for handling materials requiring inspection, or immediately clearing those not requiring it. Guaranteed consecutive numbers create an audit control and a tracer record.

NOTIFICATION: Handwritten or typewritten, a Standard System provides sufficient copies, all created at one writing, for prompt advice to Production Planning and all departments concerned. This includes proper supporting records for Accounts Payable, as to quantities, and acceptance or rejection—quickly clearing invoices for discounts.

57.14% of "Paperwork" Eliminated by Seiberling System

SEIBERLING Rubber Company is one of hundreds of leading American industries now deriving the advantages of simplicity, speed, and *control of material* provided by Standard Systems applied to their individual problems. Seiberling removed the constant threat of materials piling up with records incomplete, when they replaced a method requiring the original record to be transcribed by typist. A Receiving Report System handwritten on Standard Registers reduced 7 form-handling and writing operations to 3—a 57.14% elimination of operations.

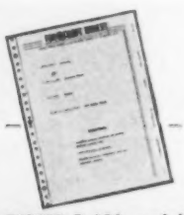
You'll be interested in this case-story as one example of how basic principles of Standard's Systems (handwritten or typewritten) improve control not only in receiving but in all material control, production, shipping and other functions.

THE STANDARD REGISTER COMPANY • DAYTON 1, OHIO

On the Pacific Coast, address Sunset McKee-Standard Register Sales Company, Oakland, Calif., and in Canada, Crain Printers, Ltd., Ottawa, Ontario.

Standard Systems

OF INDUSTRIAL CONTROL



FORMCRAFT DIGEST D-152 explains the Seiberling Receiving Report System in complete detail, including the forms "before and after" and a Flow-Process Chart.

Standard is the originator, in continuous business forms, of these distinctive marginally punched holes which are Marks of Identity of the continuous forms of The Standard Register Company—"the Forms with the Punch."

THE STANDARD REGISTER COMPANY, 803 Albany St., Dayton 1, Ohio
Please send me your Formcraft Digest D-152 describing the Seiberling Receiving Report System.

NAME_____

FIRM_____

ADDRESS_____

Design Futures

IN BUSINESS MACHINES

By
FRANCESCO COLLURA

WITH the postwar era as their focus, the men who plan tomorrow are speculating on the effects of today's war-born technological advances, which they feel will revolutionize business and living. Although some of the present innovations and changes are of course only temporary, many will continue to influence the future. Without question, some of these changes will be revolutionary, even epochal. Others, as in the case of several recent sensational developments, have a long pre-war history of laboratory research, and now the war has presented a necessity for their utilization.

Indeed, the past few decades have been marked by a constant flow of industrial miracles—mechanical, chemical and electronic. The home, industry and the executive office have all witnessed the progressive introduction of new inventions and constantly improved products.

Of these new things, many of them are now being used exclusively for destruction and protection. The big problem will be their adaptation for greater convenience, comfort and pleasure in the peace which will follow.

In the administrative and executive divisions of industry, a wide variety of business machines are daily performing intricate tasks. Inventive genius in the research departments of business machines and office equipment manufacturers has given us administrative machines whose performance ranks them among the world's mechanical marvels. Manufacturers of such equipment are now on all "all out for war" basis. Any work they would do on

Francesco Collura, President, Designers for Industry, Inc., of New York

their products would be maintained a secret, at least for the present. The extent to which present research will alter the complexion of their products in the postwar world is something which only they know. However, in due course after the signing of the peace terms, there will undoubtedly come many new conceptions in office equipment and appliances.

It may perhaps be true that *some* of our office and business machines will of necessity have to re-enter the peace-time period with familiar mechanisms and styles, for developing, testing and proving new concepts is time taking. Manufacturers cannot afford to make "guinea pigs" of executive offices with untested and unproved equipment, and it cannot be denied that modern office equipment is symbolic of outstanding functional achievement.

The greatest weakness for the most part in modern office equipment is that its appearance is not fitted to either its function or its position in the office. Future business machines, as well as other office furniture, will first of all function efficiently; second, will be more comfortable for the operator; third, will take on a character expressive of the machine; and fourth, will also embody design elements that will give them the warmth of appeal necessary for liveability. They will not be furniture as we know it in the home, but rather will be expressive of the office atmosphere of which they are a part. This will result in a distinctive character for business machines and furniture. They will be as liveable, and rightly so, as our homes. This should and will become necessary because of

(*Continued on page* 168)

THE NEW HILL BUSINESS CARDS CAME IN TODAY!

No wonder he feels like an archangel—this purchasing agent gets the best business cards on the market and still saves time, money, and record-keeping detail.

He makes no investment in master stock, needs no inventory records—pays-as-he-goes, yet gets a wholesale price. And it's quick service, too. One-color orders go out the same day they reach our plant . . . *direct to the user* to eliminate double handling. The cards are packed in our Special 25-card Economy Cases to keep them clean and fresh and cut waste from dog-eared throw-aways.

Send us your approximate yearly quantities of business cards and letterheads with a sample of each—we'll send estimates and suggestions for their improvement at no obligation.

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INCORPORATED
270 Lafayette St., New York 12, N.Y.
Telephone CAnal 6-6340

Makers of
FINE BUSINESS CARDS AND LETTERHEADS
Since 1914
ENGRAVED OR THERMOGRAPHED

the amount of time spent by people in this environment.

These improved machines will find additional uses in the postwar world, among which will be in drafting rooms where business machines are used for scientific mathematical calculations heretofore done by hand. This has already been brought about to a great degree by the urgent necessity of the war program.

But let us look at this subject from another angle. As a group there is possibly no other body of men in the country so well versed in current technological progress as the industrial purchasing agents. It has become their responsibility to keep abreast of other things besides CMP and its rules and regulations. Their's is the job of keeping the wheels of industry moving, not only to provide the sinews of war and necessary civilian products, but also equipment and supplies for executive administration. They have to keep informed on new materials, new machinery, substitute materials, new processes, new methods and new finishes.

It is but natural that they give thought to the utilization of these things in the postwar era, and the influence of such use on their own activities. Many minds have been conditioned to expect fantastic developments and to speculate on what they will mean to living in the future.

Staid business men as well as visionaries have allowed their imaginations to soar. They speak of the huge production of a million tons of aluminum, the large production of magnesium, the new roles assumed by plastics, synthetic fabrics and leathers, and so on. They feel that our stupendous production of synthetic rubbers, along with plastics, will force old man rubber to move over on his throne where he has reigned so many years in the production of some eighteen or twenty thousand items. Impregnated plywoods and flexible bag molding, laminated plastics, and electronics have become familiar subjects of conversation.

This predicted new world of aluminum, plastics and synthetic rubber, where new materials give added benefits in both the fields of performance and reduced costs, will also have room for traditional materials in those uses for which they are still superior and also in those new processes and new methods which are being adapted to the production, fabrication and use of

(*Continued on page* 172)

Wise personnel and office managers are looking into the "little things" that help keep workers on the job.
Old Dutch Line products—Typewriter Ribbons and Carbon Papers—offer top quality advantages appreciated by secretaries *AND* executives. Clean-sharp impressions, easy to handle, smudge-free, longer-lived ribbons and carbons . . . Qualities that have become second nature to us in more than 43 years of superior product development.

ASK THE *OLD DUTCH* SALESMAN!

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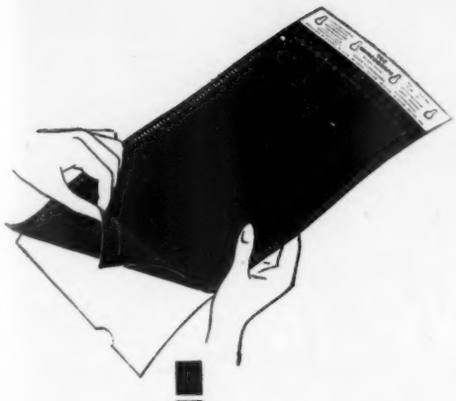
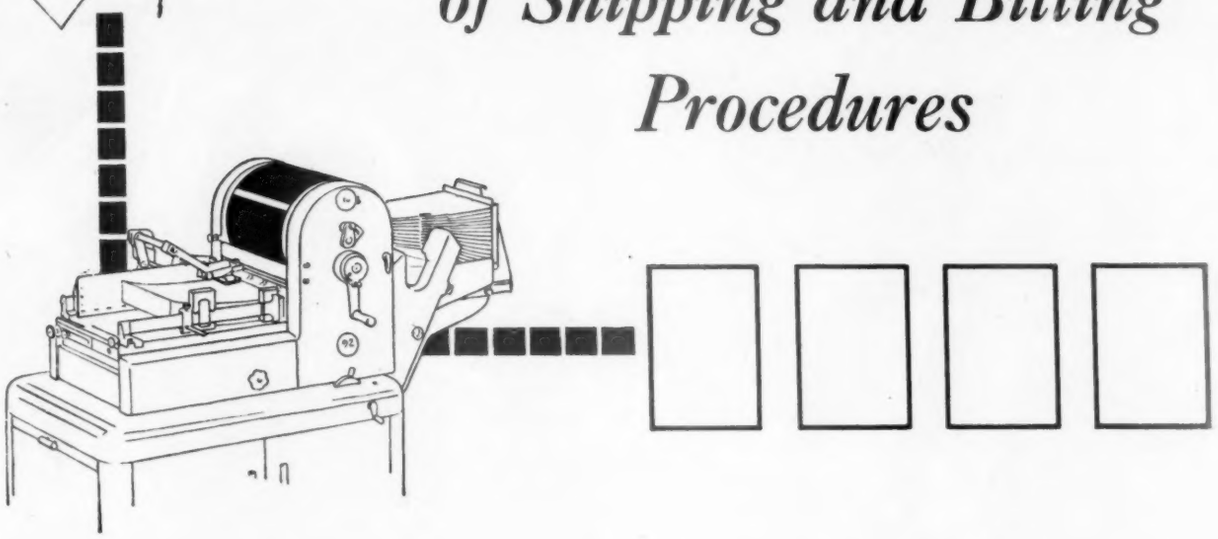


SURER CONTROL

of Shipping and Billing Procedures



All the paper work needed to ship and bill merchandise . . . produced from a single writing with Mimeograph stencil duplication

An increasing number of large and small plants all over the country are turning to Mimeograph duplication as the surer control method of handling shipping and billing procedures.

The paper work for invoices, shippers and packing lists—even the government receiving and accountability reports, where called for, is reduced to a single writing on a Mimeograph brand stencil sheet. Clean, legible copies in required quantities are produced in a matter of moments on the Mimeograph duplicator.

This single-writing method eliminates many possibilities of error, saves time wasted on rewriting and *helps assure shipment of correct merchandise in the right quantity.*

FOR FULL DETAILS SEND FOR FREE FOLDER "Speedier Shipping and Billing Procedures"

For your convenience, a clear, simple, step-by-step explanation of the single-writing method of handling shipping and billing procedure has been prepared in handy folder form. It is yours without cost or obligation. Find out now, by writing for this folder, how Mimeograph duplication can solve your shipping and billing problems. Send coupon below to A. B. DICK COMPANY, Chicago.

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MIMEOGRAPH is the trade-mark of A. B. Dick Company, Chicago, registered in the U. S. Patent Office.

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Send me a free copy of the folder, "Speedier Shipping and Billing Procedures."

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Now...

SPIRIT DUPLICATING IN

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jet-rite The *CLEAN* Process
... *No Soiling of Hands or Copies*

At long last it's here ... spirit duplicating in real Black. Old Town's **jet-rite** process is brand new. With it Black copies can be made on any spirit duplicator. ***No change in machine equipment is necessary.*** No longer time is consumed. No greater care is required.

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Every user of Spirit Duplicating needs **jet-rite**

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OLD TOWN
Now offers the jet-rite process
for Spirit Duplicating in . . .
BLACK
Any business form of which copies are required, can now be copied in real Black. Invoice – Purchase Order – Price Inquiry – Material Requisition – Payroll Form – Factory Order – Production Record – Inspection Report – Shipping Order – Receiving Report – Assembly Order – Sales Bulletin – Sales Analysis – Instruction Sheet – etc.
Black Hi-test master units and Black Hi-test Dupli-Forms, as well as Black Hi-test spirit carbon are available for the jet-rite process. Used with Old Town jet-rite duplicating fluid, clear, legible Black copies can be run off on any Spirit Duplicating Machine.

For the ultimate in simplification and convenience, use either master units or printed Dupli-Forms. Here is the perfect matching of carbon and paper, absolutely accurate registration, clean handling and freedom from smudging. Besides the new Black, these exclusive Old Town products are also available in the standard colors.

Old Town is the world's leading producer of carbon papers, ribbons and supplies for Spirit Hectograph Duplicating. The reputation of Old Town products is built on high quality. They are the best money can buy —the result of continual research by experts. *Old Town's facilities are at your disposal. Write for information and samples.*

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Foremost Makers of Ribbons and Carbons for Every Use

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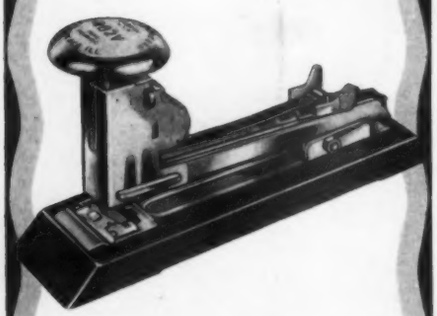
THE NEW
ACE
WARTIME MODEL



A Machine You'll Always Respect!

War restrictions have affected the production of practically every type of machine . . more especially those requiring vital materials such as metals and rubber. The scramble for substitutes and synthetics has often resulted in an inferior piece of finished merchandise.

When we began to develop a new wartime model, we realized that ACE had a world-wide reputation at stake. Only a machine that would live up to this high standard of quality would do. Today this New Ace Wartime Model is a reality. It's a machine that fulfills the Ace tradition of making only the best. Its smooth, easy, efficient operation reflects the skilled, precision engineering and fine workmanship built into it. Shipments will be allocated to those qualifying with priority ratings.

SOLD THROUGH DEALERS EXCLUSIVELY

ACE FASTENER CORPORATION
3415 No. Ashland Avenue, Chicago, Ill.

ACE The WORLD'S FINEST Stapling Machines
FOR EVERY PURSE AND PURPOSE

(*Continued from page* 168)

the ferrous and non-ferrous materials to produce materials of finer finish, lighter weight and greater strength.

It would be wrong to deny that aluminum, for instance, will find many new uses, and that aluminum or magnesium will take the place of other metals in a variety of applications. But, the cost factor must not be overlooked, and we should not forget that today's huge production of aluminum is little more than one percent of steel production. In the plastics field, not only is the primary cost figure a vital one, but here we should not overlook the fact that today's total production of plastics—all kinds, is but 200,000 to 250,000 tons annually, a fraction of one percent of the ferrous and non-ferrous metals production.

Obviously, the increasing production of these materials will find a place in business and civilian products, as will the new deevlopments in ceramics, glass, synthetic fabrics, and other products. A growing supply of plastics is rapidly replacing parts and whole articles heretofore made of metal, and although it is not as yet a structural material in itself, it has in many cases proven a more successful material. Already it has contributed much and will contribute more to the betterment, both from the standpoint of function and production, of our manufactured commodities.

Laminated plastics and plywoods bid fair to make serious competition in many lines. And the synthetic rubbers and plastics are bound to prove relentless competitors in markets formerly dominated by natural rubber when costs reach a plane comparable to that of natural rubber.

In some instances, substitute materials are proving to possess unsuspected merit, and in addition are reducing cost and improving quality. One of the most important contributions in the materials field has been made by the plywood industry. Weight for weight, impregnated plywood is stronger than many steels. It is available in extremely large sheets, it can be fabricated easily, and molded to curved surfaces. Heretofore, in many cases, metal has supplanted wood because it can be put in the production line for low cost manufacture. One of the recent interesting adaptations of plywoods to office machines is the laminated plywood register developed by the Standard Register Company. It also has hardwood working parts. It may be a forerunner of new things in the business machine and equipment field, provided tooling and assembly costs are not prohibitive and mechanical improvements are gained by so doing.

I would hesitate to venture an opinion as to what materials will be "the materials of the future." One thing is certain, materials that can be formed to the desired shape at a reasonable cost with a minimum of operations will be the materials that will survive in the postwar days ahead. Today's increasing tendency towards greater mechanization in industry and low cost production ideas and techniques will add its contribution to future design and product development, not only in the business machines and office equipment fields, but in all lines of industry. And the materials that can be depended upon to render a specific service and which can be fabricated economically, will be the materials that will be used.

In due course, the new equipment in production plants, new techniques in fabrication, in tooling, molding and assembly will make themselves felt, and the introduction of really new things will as in the past follow well defined lines of testing and proving.

We will in a progressive manner witness the introduction of office tools that involve greater ease of operation, and more physical comfort for the user. We will see the introduction of machines, cabinets and other office equipment styled to affect an administrative atmosphere rather than that of a production line.

OPA REVISES REGULATIONS COVERING SALES AND RENTALS OF USED TYPEWRITERS

Complete revision of the regulation fixing ceiling prices for all sales and rentals of used typewriters has been made by the Office of Price Administration to adjust price controls to the altered market conditions and broad changes in rationing rules which have developed during the 12 months since the original regulation became effective.

Revised Maximum Price Regulation No. 162 (Ceiling Prices for the Sale and Rental of Used Typewriters), effective July 31, 1943, makes many adjustments in prices but no increase in general costs to the ultimate user will result.

All changes effected in the new regulation were extensively reviewed at conferences between OPA and the three Industry Advisory Committees represent-

(*Continued on page* 174)

Why Crane Company uses Parker Quink exclusively—

"We are now using Parker Quink with Solv-x throughout our general offices, our factories, and our 127 branches in the United States. We have found it very satisfactory. One of its principal advantages being that it increases the life of steel pens."

H. H. Simmons

Crane Company, Chicago

HAVE YOU TRIED PARKER'S NEW BLACK INK? PERFECT FOR EVERY USE!

"MICRO-FILM BLACK" QUINK

Writes black—dries black!

The experience of Crane Company with Parker Quink is typical of the findings of thousands of big ink users who have changed over to this entirely new kind of writing fluid.

Smooth-writing, brilliant Parker Quink—made by a secret formula—contains *solv-x*. No other ink possesses this ingredient, which ends gumming and clogging . . . prolongs the life of both fountain pens and steel pens.

Newest development of Parker scientists is "Micro-film Black" Quink. This intensely black, all-purpose ink writes *black* . . . dries *black!* It is especially recommended for correspondence, records and checks. It photographs perfectly, making it excellent for such processes as Recordak.

Mark your next writing fluid order: "Micro-film Black" Quink. You'll find, like Crane Company, that it saves you pen failures . . . cuts costs. For complete information, write: Box P-8, The Parker Pen Company, Janesville, Wisconsin and Toronto, Canada.

Especially economical in pints, quarts and gallons.

SOLV-X
in every bottle of Quink...
protects pens in 5 ways!
1. Protects rubber . . . lengthens the life of sac or diaphragm.
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Parker Quink

PARKER QUINK

THE ONLY INK CONTAINING PEN-PROTECTING SOLV-X

The Name Indicative of Preeminent Carbon Paper Performance

YOU associate the word SILK with strength, beauty, quality . . . the word GAUZE with transparent yet tough fabric. Because this word combination is analagous to the outstanding performance factors which the ideal carbon paper should *and does* possess, SILK GAUZE is the name that has been given to Columbia's preeminent carbon sheet.

Beautiful carbon copies — carbon paper clean and easy to handle — should make SILK GAUZE your choice for low cost, quality work. Ask your dealer for test samples. Or write the Columbia office nearest you.

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155 West Congress Street, Detroit, Mich.
227 East Michigan Street, Milwaukee, Wis.
200 Plymouth Building, Minneapolis, Minn.
107 Union Street, Nashville, Tenn.
1508 Fox Building, Philadelphia, Pa.
208 Standard Life Building, Pittsburgh, Pa.
205 East 6th Street, Cincinnati, Ohio
(Harris-Woers Company)
Also: London, England; Sidney, Australia

(*Continued from page* 172)

ing manufacturers, wholesalers and retailers. Since most used machines now are held by independent dealers, the Typewriter Dealers Industry Advisory Committee was especially active and many of its recommendations were adopted, OPA said. The National Office Machine Dealers' Association also conducted two extensive surveys, the findings of which were the basis of alterations appearing in the revised regulation.

Basic changes in the new regulation follow:

1. The section concerning portable typewriters has been rewritten in specific detail, replacing the looser provisions previously operative. The new schedule of portable typewriter prices, like the ceilings on office-size machines, is based on those prices which were in effect October 1-15, 1941, and has been adjusted upward in the case of reconditioned and rebuilt portables to reflect higher rehabilitation costs prevalent during March 1942.

In general, the new schedule increases retail prices on the newer and more complete portable typewriters, and decreases retail prices on the older and less complete models. Because, for the most part, only the latter class of machines may be sold under terms of the rationing order, the effect of the revision on sale prices is downward. Of the 21 groups of portable typewriters, classified by age and by type, machines in 16 groups may be sold under the rationing order. Of these, only two groups may now be sold at prices higher than those established by the original regulation. The net effect of these changes is therefore a reduction in the cost-of-living to home users, such as students, with savings to the purchaser ranging up to $13.50 per machine.

Ten Portable Groups

Dollars-and-cents prices are scheduled for all kinds of portables. Machines are subdivided into five age groups and five quality groups and ceiling prices established for each group. This grouping has resulted in the elimination of cases arising under the former schedule where some used portables had ceilings below their normal market values and, conversely, other used portables were allowed prices above manufacturers' list-prices when the machines were new.

2. A more precise rent structure is established. The original regulation fixed maximum rental rates at $3.50 and $3.00 per month for standard-carriage office-size used typewriters, the differential depending on the age of the machine. OPA's study of the basis for these two rental rates revealed that they depended more on the usage given the machine, than on its age, and for that reason today's revision establishes a maximum rate of $3.50 per month for typewriters rented for "commercial" (business and professional) use, and a rate of $3.00 per month for those rented for "non-commercial" (student and home) use.

The new regulation also reclassifies office-size typewriters according to their carriage widths, so that the new categories more closely reflect market differentials of the base period. For example, the commercial rental rate for early-model machines of 14-inch carriage width is increased from $3.00 to $4.00 per month, while older typewriters of 26-inch carriage width now rent for the reduced charge of $8.50 per month instead of $9.00, as formerly.

The revised schedule, compared to the 1-month rental rate for wide-carriage machines made before 1935, as fixed in the earlier regulation, involves three increases and three decreases in commercial rates and four decreases and one increase in non-commercial rates.

Adjustments also have been made in rental rates for electric and special-purpose machines, as well as for typewriters rented in the United States possessions and territories.

Lower Rates Without Maintenance

Because the nationwide scarcity of typewriters has encouraged private individuals to rent out their own used machines, and caused dealers to rent typewriters to places so distant from their stores that normal maintenance service could not be included, the new regulation establishes rates one-third lower than those for normal rental in cases where the dealer gives no free maintenance service at the place where the machine is used. Rentals without maintenance may be offered at option of dealer or supplier.

Investigation by OPA revealed that many dealers have been withdrawing their customary offer of a lesser rental rate for a 3-months period, and requiring customers whenever possible to enter into month-to-month rental agreements at the higher single-month rate. The new regulation corrects this situation by requiring that the 3-months charge pro-rated for the rental period shall apply whenever the customer offers to make a 3-months contract with a dealer.

All suppliers renting typewriters must post on their premises a clearly legible sign summarizing particulars of the ceiling rate. For convenience of the trade, this sign has been incorporated in a retailers' bulletin which will be distributed to dealers. Additional copies will be obtainable at district and regional OPA offices.

On sales of used typewriters to dealers, the previous regulation established a ceiling at two-thirds of the retail selling price. The revised regulation retains this percentage for sales to dealers by private individuals, but permits machines to be transferred between dealers at prices which are eighty per cent of the retail selling price. This change was effected to promote the flow of typewriters into areas of present scarcity. Such machines, under the rationing order, may only be rented, not sold, to the public, and consequently no squeeze on dealers' margins will result from this change.

With respect to dealers' trade-in allowances and guarantees, the new regulation establishes uniform practices, whereas the former regulation "froze" each seller to his customary individual practices. Since variations in these practices had the effect of penalizing dealers who offered the most favorable terms

(*Continued on page* 178)

The Guardsman line of WOOD FILING CABINETS

5-DRAWER LETTER
4-DRAWER LETTER
3-DRAWER LETTER
2-DRAWER LETTER
3-DRAWER JUMBO
6-DRAWER 8x5 CARD FILE
8x5 and 8x8 CROSS TRAYS
MAP AND PLAN UNITS

- **is built for years of service**
- **meets any filing problem**
- **NO PRIORITY REQUIRED**

Your clerical staff may be dwindling . . . but your flood of paper work isn't. You must have adequate filing space to keep your records shipshape. Besides, many governmental regulations require certain operating records to be retained for two and more years.

The wide range of the Guardsman Wood Filing Cabinets offers you a clear solution to filing troubles. Eliminate needless transferring, searching delays, overcrowding, and make-shift adaptations of overworked filing equipment. To save time and money, to minimize errors and to ease the burden of work all hands around . . . *see the attractive Guardsman at your nearest Remington Rand office . . . NOW!* (Consult your local telephone directory.)

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TABULATING CARD FILE
5x3 SUBSTITUTE DRAWERS
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is available for
IMMEDIATE DELIVERY!

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SAVE

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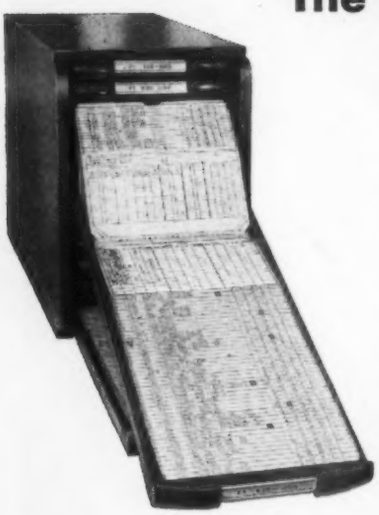


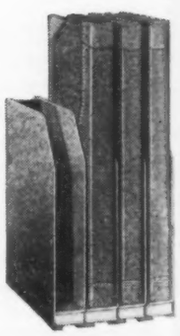
SHORT of help—equipment scarce—material hard to obtain—transportation slower—all these difficulties are being overcome every day by the ingenuity and perseverance of American men and women. And, every day Acme Visible Records Systems are justifying their reputation in helping War Plants, Factories, Ordnance Plants, the Armed Services, Government departments and many others to accomplish more with less effort.

The tremendous pressure on industry today calls for better planning and control methods. The men responsible for getting things done must have facts available at all times, instantly and accurately. Through their wide experience with record installations in War Industries, Military establishments and Government departments, Acme representatives are singularly equipped to recommend record systems that increase speed and promote efficiency.

TIME

Every day more and more key men in Government and Industry are turning to Acme Visible Systems to solve problems of record control

Descriptive literature is available: PURCHASE AND PERPETUAL INVENTORY RECORDS—ask for Acme booklet No. 387 . . . PRODUCTION CONTROL RECORDS—ask for Acme booklet No. 417 . . . CMP ALLOTMENT RECORDS—ask for Acme booklet No. 440 . . . MANNING TABLES AND REPLACEMENT VISUALIZATION—ask for bulletin No. 1398 . . . WAR RECORDS (various kinds)—ask for "Manual of '304' use Tested Acme War Records."



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Picked for the job!

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"have taken off *Silk* ... put on KHAKI"

But willingness to rough it and the quality of courage are not all that's needed. How does the candidate for the Corps shape up for clerical work, mess work, mechanics? Can she drive an ambulance, jeep, or 1½-ton truck where the going is tough?

She must be earnest, military, immune to "group giggling". . . capable of taking orders and of giving them. Be able to make a "taut" army bed, clean barracks and police them, master basic infantry drill—all to the captain's taste.

International Mimeo Script and Duplicator are also "picked for the job" because they both give maximum-speed production for duplicating work. International Duplicator is ideal for gelatine and spirit processes. They, too, can "take it".

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PAPERS FOR PRINTING AND CONVERTING

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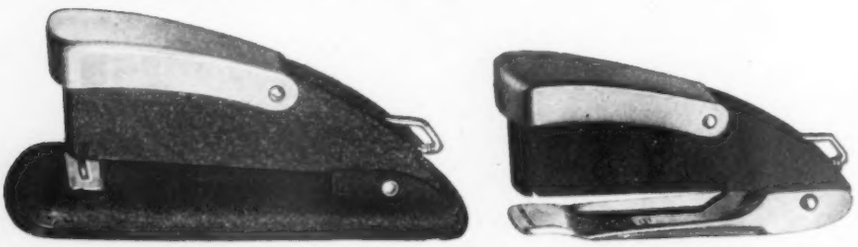
The larger your concern, the more it can help the war program by using tiny staples instead of other wire paper fastening devices which use over seven times as much steel. Also staples make each file drawer apparently several inches longer because filed papers fastened with staples lie closer together in the drawer.



MODEL S122A MODEL S122P

These two models No. S122A for desk use and S122P, a portable stapler are still available on priorities. They use inexpensive standard size staples and list for only $1.90 each.

Write today for attractive quantity prices.

STAR Paper FASTENER CO.
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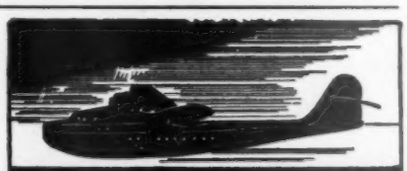

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Specify one of

ESLEECK
THIN PAPERS

Ideal for Air Mail, Branch Office and Foreign correspondence.

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to their customers, while rewarding those who offered less, the change is obviously fairer to all, OPA said.

Under the new regulation, a guarantee of one year is required on the sale of a demonstrator; a guarantee of six months on a rebuilt typewriter, and three months on a reconditioned machine.

While the new regulation establishes rental rates with far greater detail and accuracy, it puts less emphasis on selling prices for the reason that nearly all typewriter sales at retail are prohibited by Ration Order No. 4A.

* * *

W. FRANK WALLACE HEADS PEN & PENCIL MFRS. ASSN.

The newly formed Fountain Pen & Mechanical Pencil Manufacturers Association, Inc., recently held its first meeting at the New York Athletic Club, and installed the following officers:

W. Frank Wallace

President, W. Frank Wallace, president & treasurer of Inkograph Co., Inc., New York.

Vice President, T. Hirsch, Salz Brothers, Inc., New York.

Treasurer, J. R. Frank, American Improved Products, Inc., New York.

Secretary, A. H. Berwald, Eagle Pencil Co., New York.

Executive Secretary & General Counsel, Norman L. Marks.

The executive committee consists of the officers, and the following: Julius M. Kahn, chairman, David Kahn, Inc.; A. G. Frost, Easterbrook Steel Pen Co.; J. C. Musser, Eberhard Faber Pencil Co.; E. J. Stern, Scripto Mfg. Co.; George Bartol, C. Howard Hunt Pen Company; and, Clinton Marshall, Marshall & Meier.

* * *

JOHN H. LOGAN MADE VICE PRESIDENT OF VISIBLE INDEX

The Visible Index Corp. announces the election of John Hardman Logan to the office of Vice President.

Mr. Logan, who joined the organization three years ago, was formerly vice president of Bondex, Inc., Financial Consultants. He was elected secretary-treasurer of Visible Index Corp. in January, 1941 and of VISIrecord Printing Corporation and VISIrecord Sales Corp. in the fall of 1942.

Mr. Logan will retain the title of treasurer of Visible Index Corp., and will continue in the duties of this office.

Dear Mr. Williams: Your letter describing the confused state of the bank-note market echoes a common plight of fellow bankers in this region and elsewhere. Like yourself, they complain of the time spent by their tellers consulting the newspapers for current discounts and turning to the latest "detector" to distinguish the counterfeits that are in circulation. And they ask us, as you do, if some means may not be devised for the protection of the notes they issue.

Our papers, which you and other bankers have been using these several years, afford more than ordinary protection against counterfeiting, by virtue of their durable quality and watermarking. But my son, Zenas Marshall, has been carrying on some experiments that promise to enchance their distinctiveness and increase the difficulty of fraudulently raising notes to higher value. The device employed is the introduction into the cotton and linen fibres of numbers corresponding to the value of the notes to be issued.

These new papers are now in course of making and some sheets are already in our loft for drying and seasoning. When this rather slow, but necessary, process is completed, we shall have examples for your scrutiny. We are confident that examination will reveal them to be a practical solution of this vexing problem, and that the quality of our paper has likewise gained from this application of our experience and our spirit of enterprise and experiment.

To me, the desire to reach out into new fields and broaden the market for, and usefulness of, our papers is the spark of ambition that is of greater value to my sons than any legacy of mills and machines. So it is with special pride that I acknowledge the responsibility for this development and bespeak your consideration of the new paper when it is placed before you in Northampton.

Truly yours,
ZENAS CRANE

Dalton, Massachusetts
10 August 1844

For 142 years the Crane mills in Dalton have made papers of linen and cotton fibres only. Employing these durable materials, experience and enterprise continue to yield papers of the utmost quality and durability for letters, documents of record, tokens of value, and for many war-time needs and purposes, chief among them the War Bonds we buy that our arms may prevail and our freedoms be secured anew and for all time.

CRANE'S FINE PAPERS • MADE IN DALTON, MASSACHUSETTS • SINCE 1801

prevent pressure losses

● In force-feed lubrication of bearings, use *babbitt-tipped* Laminum shims to prevent oil and pressure losses. Shims cut to your specifications provide accurate laminations for quick precision adjustment.

Shims cut to your specifications. Stock shim materials obtainable from your dealer. Write us for further information and shim application chart.

Laminated Shim Company
Incorporated
90 Union Street • Glenbrook, Conn.

LAMINUM
THE SOLID SHIM THAT peels FOR ADJUSTMENT
2045

SIGNATURE OF ENDORSEMENTS OR CERTIFICATION

J. Joseph Whelan, Recording Secretary War Production Board, Washington, D.C., released the following regulation, Priorities Regulation 7, as amended, July 6:

§ 944.27 *Priorities Regulation No. 7: Signature of endorsements or certifications.* (a) Whenever an order or regulation states that a purchase order or delivery order (or a document referring to it) must carry an endorsement or certification, the endorsement or certification must be signed by the party placing the order or by a responsible individual who is duly authorized to sign for that party. The signature must be either by hand or in the form of a rubber stamp or other facsimile reproduction of a handwritten signature.

(b) If a facsimile signature is used, the following requirements must be observed: The individual whose facsimile signature is used, or another responsible individual who has been duly authorized by him to act for him, must give his approval each time the facsimile signature is put on an endorsement or certification. This approval must be shown each time by a written record signed or initialed by the individual who approves the use of the facsimile. A single record may refer to several purchase or delivery orders as to which the use of the facsimile signature has been approved at the same time, but each order must be separately shown on the record. The record need not be sent out with the order but must be kept on file with it for at least two years for inspection by representatives of the War Production Board.

(c) The party who places the order, the individual whose signature is used, and the individual who approves the use of the signature will each be considered to be making a representation to the War Production Board that the statements contained in the endorsement or certification are true to the best of his knowledge and belief, subject to criminal penalties for misrepresentation.

(d) The provisions of this regulation supersede any inconsistent provisions in any regulation or order issued before July 6, 1943, regarding the way in which endorsements or signatures are to be signed.

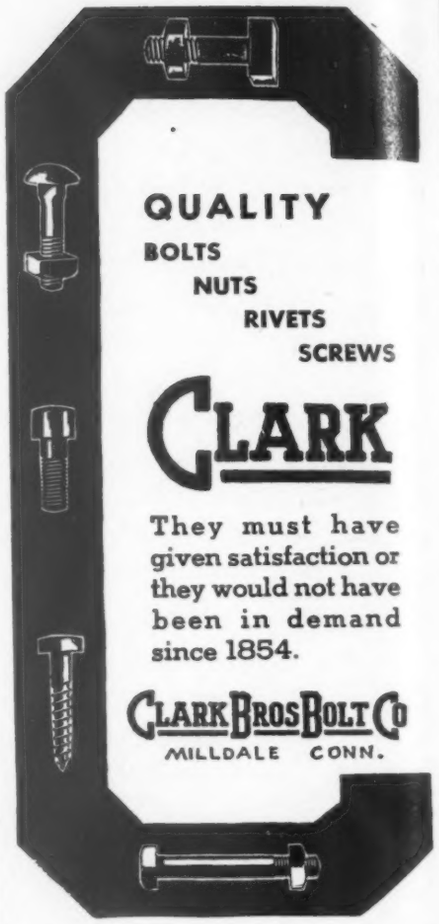
ZINC SUPPLY CRITICALLY INADEQUATE

War Production Board rates zinc as among those materials whose supply is critically inadequate to meet the wartime needs of the nation.

Today, the chief uses of zinc are military. The brass cartridge cases are composed of an alloy containing 30% zinc. The steel plates and the metal sheets of which ships are made are coated with a fine layer of zinc, as are steel cables and wire used by our armed forces. The zinc covering — galvanization — protects the steel from rust.

In the aircraft industry, zinc is used in die-casting. In chemical warfare, zinc

(*Continued on page* 182)



Bending Channel with DI-ACRO BENDER No. 1

GIRL MAKES PARTS

NO DIES — NO DELAYS — "Beat the Promise" on delivery this new way: Use The DI-ACRO System of "Metal Duplicating Without Dies" — and have parts finished before dies could hardly be started.

DI-ACRO Machines — Shears, Brakes, Benders — are precision-built STANDARDIZED units so designed you can readily convert them into highly SPECIALIZED productive machines suited to your own particular needs. You may adjust, alter or remove any of the original contact surfaces, attach operating clamps, guides and gauges, or quickly set up your own forming surfaces. The result is a practically unlimited adaptability for DIE-LESS DUPLICATING. **Write for catalog — "Metal Duplicating Without Dies".**

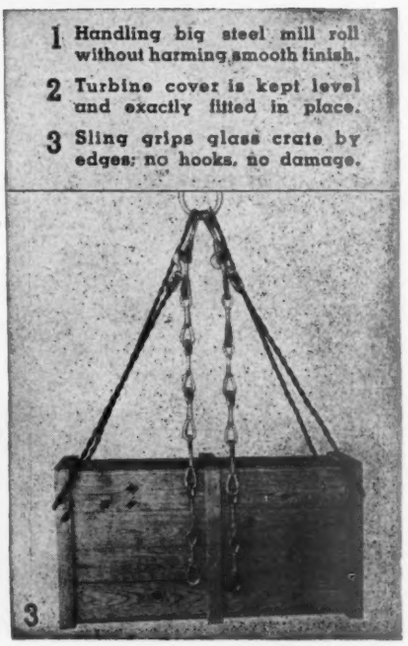
O'NEIL-IRWIN DI-ACRO MFG. CO.
305 Eighth Ave. So. • MINNEAPOLIS 15, MINN.

Easy to Answer!

▸▸ *Question:* What is the safe, quick, economical way to handle a load that is

HEAVY... like a turbine cover?
HIGHLY FINISHED... like a paper mill roll?
IRREGULAR... like a casting?
FRAGILE... like a crate of plate glass?

See Answer Below


1 Handling big steel mill roll without harming smooth finish.
2 Turbine cover is kept level and exactly fitted in place.
3 Sling grips glass crate by edges; no hooks, no damage.
3

FREE—

RIGGERS' Hand Book

You'll use this practical wire rope information often. 96 handy pages of facts, tables, illustrations. Send for your free copy *today!*

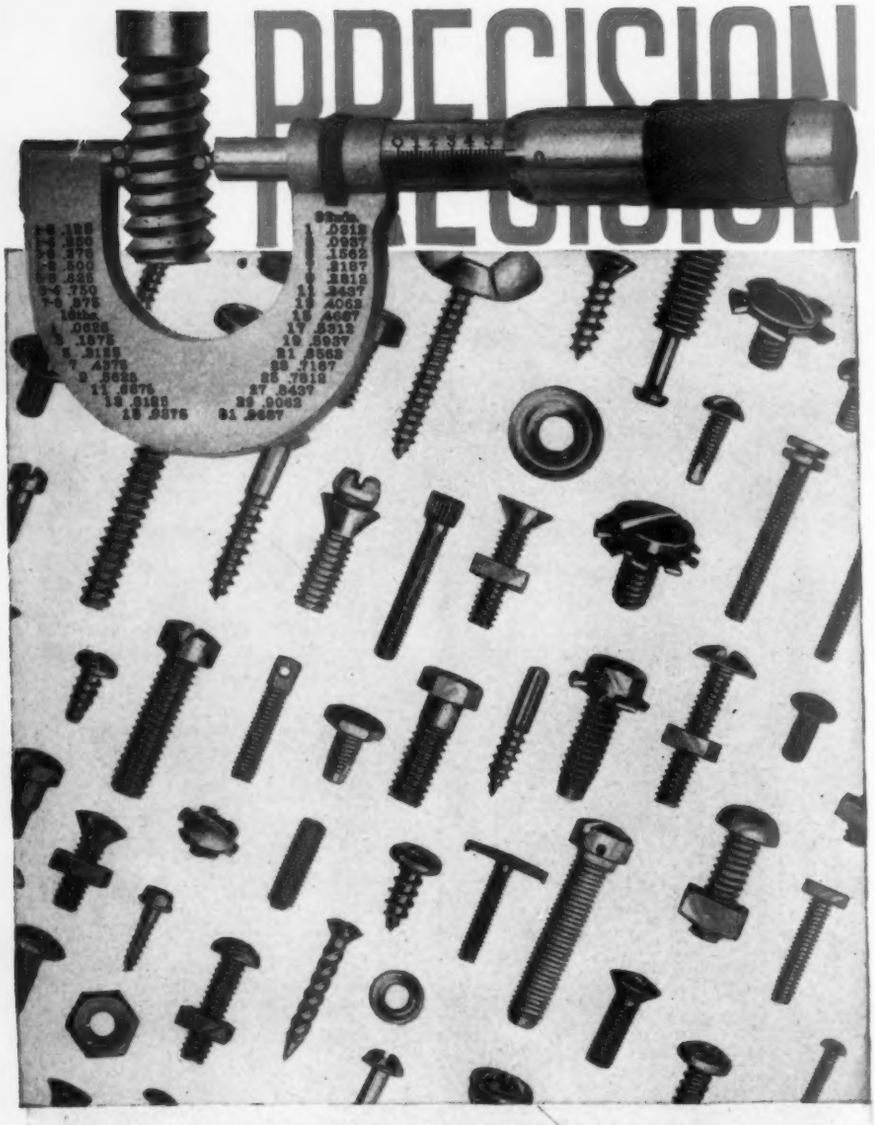
The answer to handling *any* "problem" load more easily is a Yellow Strand Wire Rope Plaited Safety Sling.* Flexible, light-weight and kink-proof, this patented type will hoist a locomotive or a barrel with equal security. Each sling has the *stamina* of Yellow Strand Wire Rope. Braided by our expert splicers, its exceptional *pliability* enables it to grip a load softly, snugly and without damage to a delicate surface.

By adding hooks, thimbles, links, shackles, turnbuckles or other fittings, standard Yellow Strand Plaited Safety Slings* are adaptable to products of varied size and shape. If you need a special sling for your special problem, our engineers will design one promptly. For more efficient, more *economical* handling of materials, investigate Yellow Strand Plaited Safety Slings.*

BRODERICK & BASCOM ROPE CO., ST. LOUIS
Branches: New York, Chicago, Houston, Portland, Seattle • • *Factories:* St. Louis, Seattle, Peoria

YELLOW STRAND
Wire Rope PLAITED SAFETY SLINGS*

* MURRAY PATENTS: U. S., 1475859, 1524671; CANADIAN, 252874, 258068



The war production requirements for precision in every mass produced unit of assembly are amply met by HOLTITE Screws, Bolts, Nuts and allied fastenings. Produced in great quantity with the uniform precision of small tools, these trouble-free units are gauged and inspected to strict standards of accuracy throughout every stage of manufacture. From metallurgically tested raw materials, through the wire processing mill (in our own plant), to final inspection, HOLTITE fastenings are fabricated by the most precise equipment in the industry.

Precision parts effect time-saving, reduce spoilage, and assure enduring, faultless service. Specify HOLTITE on your next order.

HOLTITE Recessed Head Screws & Bolts

Cutting driving time an average of 50%, these production-boosting screws and bolts can be driven ***safely*** by spiral, electric and pneumatic drivers without danger of injury to material or worker.

CONTINENTAL SCREW CO. New Bedford, Mass., U.S.A.
BUY MORE WAR BONDS

(*Continued from page* 180)

is needed to make smoke screen materials, which go into smoke shells and are sprayed from airplanes.

Best known of all uses of zinc is the manufacture of electric batteries. However, due to military needs for the metal, increasing limitations have been placed on the types of batteries that can be produced, and substitute materials have been widely promoted. Zinc is needed for batteries in planes, tanks, trucks, jeeps and self-propelled artillery.

The condensed fumes resulting from a heating of a mixture of zinc ore and coal yield a white powder called zinc-oxide. This compound, insoluble in water and resistant to the action of ultra-violet rays, is valuable as pigment in paints. Tanks, planes and other war machines that will be exposed to weather must be protected with paints.

BOOKLET ON LUBRICANTS

How lubricants are helping to win the war and the progress in develoment of lubricating oils are presented in a forty-page booklet "90 Years of Industrial Pioneering" published by the Swan-Finch Oil Corp, R.C.A. Building West, New York. What lubricants mean to the aviation and automobile industries, development of specialized lubricants to meet exacting needs, and varied contributions of lubricants to industry are interestingly explained and illustrated, many of the illustrations being from old industrial prints.

STOCK FIR DOOR STANDARDS

Proposed revision of Commercial Standard covering Old Growth Douglas Fir Standard Stock Doors having been accepted by the trade, revised Commercial Standard identified as CS73-43 is now effective, according to J. W. Medley, Division of Trade Standards, National Bureau of Standards, Department of Commerce, Washington. Mimeographed copy TS3494 is now available.

WOMEN'S SAFETY SHOE STANDARDS

Four standards for women's safety shoes, which will save valuable war materials and at the same time protect women workers against injuries, have been completed by the American Standards Association, 29 W. 39th St., New York, at the request of the War Production Board and Office of Price Administration. The four standards include: Women's Safety-Toe (Oxford) Shoes with steel toe-box; Safety-Toe (High) Shoes, to afford ankle high coverage; Women's Explosives-Operations (Non-Sparking) Shoes; to provide protection to the plant and wearer from sparking hazards; and Women's Conductive Shoes, to minimize hazards to workers and property from electricity accumulated in the bodies of workers. AWS specifications for Women's Safety-

(*Continued on page* 184)

CUTTING A NAME AMONG USERS OF HIGH SPEED STEELS

Tool bits in specified analyses receive the same careful quality control through each manufacturing process that is afforded to every Jessop product. They are regularly furnished hardened unground in standard lengths with 30° bevel on each end in these popular grades:

- SUPREMUS • PURPLE LABEL
- PURPLE LABEL EXTRA
- MUSTANG • MOGUL
- MUSTANG SPECIAL

JESSOP STEEL COMPANY

HEAD OFFICE AND WORKS

Washington, Pa.

ARMY NAVY

JESSOP STEEL CO. FINE JESSOP STEELS WASHINGTON, PA.

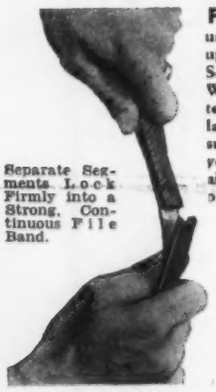
Established 1901

50 HOURS
and NO SIGN OF WEAR

• This ⅜" DO-ALL File Band was recently used on a 75" Continental Band Filer to file Sandvik oil hardening tool steel (hardness 74-77 30T) 1" thick. Light feeding pressure of 12.5 pounds was applied to the work. After 50 hours of continuous filing at a velocity of 100 feet per minute, the file band was still sharp and cutting good. At no time was there loading of the teeth. A total volume of 39.88 cubic in. of materials was cut.

DOALL BAND FILES

Developed by top-ranking metallurgical engineers to wear longer and give you a smooth finish in double-quick time. DO-ALLS meet today's demands for different styles and widths to suit every kind of material. You can't go wrong if you consult the DO-ALL file Chart for the best file and speed to use for each job.



Separate Segments Lock Firmly into a Strong, Continuous File Band.

Free File Clinic — Let us help improve and speed up your filing production. Send us any difficult job. We'll put it through every test and give you a written laboratory report. Or, consult the DO-ALL man in your locality for valuable aid right in your own plant.

New File Booklet
Tabloid form, well illustrated. Easy reading for busy people. All about DO-ALL Band Files.

THE DOALL COMPANY
1214 Thacker Street Des Plaines, Illinois

DO-ALL Offices in 25 cities, with a staff of trained engineers to give you quick service on DO-ALL Band Files and Saws, Contour Machines, Gage Blocks and Surface Grinders.

(*Continued from page* 182)

Toe (Oxford) Shoes (2nd edition) (Z41.2-1943) may be obtained from the Association at 25¢ per copy. The other standards will be available shortly.

FIRST AID FILM AVAILABLE

A new sound film presenting basic first-aid information in graphic form has just been released by the Bureau of Mines, Department of the Interior.

Produced in cooperation with a large industrial firm, the film, entitled "Help Wanted," is in 16-millimeter sound and runs 31 minutes. Copies are now available for exhibition by industrial and civil defense training classes, training courses conducted by or on behalf of the Army, Navy, and Maritime Service, and by schools, churches, colleges, civic and business organizations, and other similar groups.

In "Help Wanted," unusually effective use is made of animated diagrams superimposed over actual photographs to show blood circulation, pressure points for staunching the flow of blood from a wound, and the effect of proper treatment of bleeding.

"Help Wanted" portrays typical mishaps causing bleeding wounds, shock, burns, asphyxiation, fractures, and other injuries and methods of treating them.

Application for free loan of "Help Wanted" should be addressed to the Graphic Services Section, Bureau of Mines, 4800 Forbes Street, Pittsburgh, Pennsylvania, and should state specifically that the borrower has a sound projector. Although no charge is made for use of the film, the exhibitor is expected to pay transportation charges both ways and for loss or damage other than normal wear.

FUEL PROSPECTS FOR THE COMING WINTER

Comprehensive report by the Office of War Information, Washington, OWI 2050, states that fuel shortages the coming winter can be avoided only if: Large consumers of fuel oil, those using more than 10,000 gallons a year, convert their oil burners to coal burners—now. Both home and industrial users of bituminous coal order coal now—give their dealer the most latitude possible as to kind, size and quality, and store as much this summer as their dealers can supply. And if householders place orders for insulation, weather stripping, storm windows, etc.—now.

COAL. The nation's 1943 requirements for soft coal are largest in history. For anthracite, 1943 requirements are 5 million tons more than 1942 production. Users must get every ton of bituminous coal they can into bins and stockpiles.

OIL. The Petroleum Industry War Council estimates that the nation's crude oil requirement for 1943 will average approximately 3,990,000 barrels a day, and will rise to an average of nearly 4,270,000 barrels a day in the first three months of 1944. To meet the 1943 crude oil requirements: Transportation facilities

(*Continued on page* 186)

FIBRE-TEX
SWEEPING COMPOUND

enables him to remove oil easily and quickly, the dry-cleaning way. No mopping or scrubbing. No mess and no danger. This sweeping compound gives him three-way efficiency:

1. **PICKS UP OIL** and other fluids with amazing speed
2. **WON'T BURN** either from flame or spontaneous combustion
3. **CLEANS BETTER** —it collects dust and removes caked dirt

Wherever oil is used

in shops, factories and garages, Fibre-Tex is a true necessity. Leading industrial, transportation and oil companies find it indispensable for the promotion of better plant housekeeping and safety. At our expense, we want you to try

FIBRE-TEX
A LIBERAL TEST PACKAGE

will be sent FREE and post paid to executives who request it on their letterhead. Address

LACEY-WEBBER CO.
KALAMAZOO • MICHIGAN
AUTOMOTIVE AND SCIENTIFIC APPARATUS AND PLASTIC MOLDING

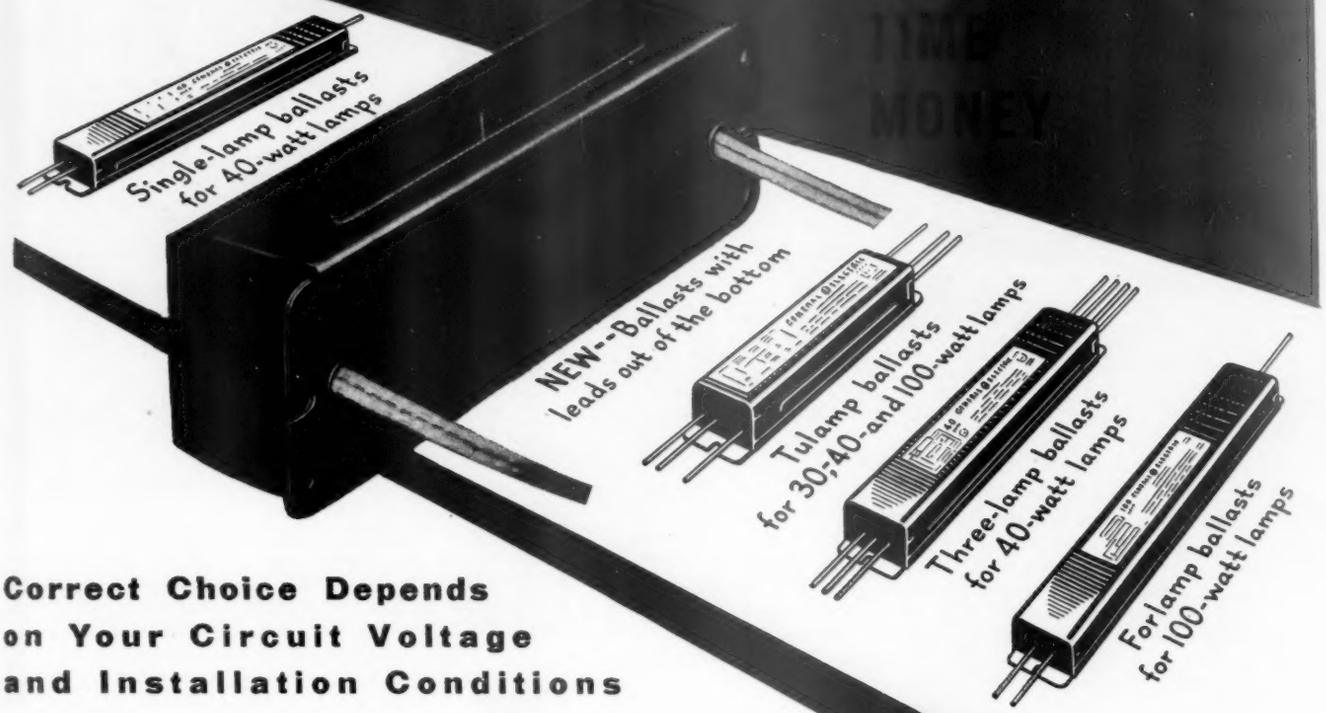
For War-plant Fluorescent Lighting CHOOSE THE G-E BALLAST THAT WILL

SAVE YOU THE MOST

MATERIAL

TIME

MONEY


Single-lamp ballasts for 40-watt lamps
NEW--Ballasts with leads out of the bottom
Tulamp ballasts for 30,40-and 100-watt lamps
Three-lamp ballasts for 40-watt lamps
Forlamp ballasts for 100-watt lamps

Correct Choice Depends on Your Circuit Voltage and Installation Conditions

Single-lamp ballasts—The natural choice for installations requiring but one lamp per fixture; used most often in restricted spaces or where low levels of illumination are sufficient.

Tulamp ballasts—Available for all lamp ratings from 15 watts to 100 watts; conserve materials in the ballast, reduce light "flicker," cut electrical losses, require fewer fixtures for a given-sized installation.

Three-lamp ballasts—Designed for use with 40-watt lamps on all circuits. You avoid use of two ballasts in one fixture, simplifying installations and saving materials.

Forlamp ballasts—For use with 100-watt lamps on 265/460Y-volt circuits; a "natural" for war-plant lighting; does the work of two Tulamp ballasts of the same rating, yet is the same physical size; in one aircraft factory installation, the use of Forlamp ballasts instead of Tulamp saved enough copper to make 95,000 cartridge casings (20-mm) and enough aluminum to make 111,000 fuse primers.

Ballasts with leads out the bottom—The most recent addition to the G-E line; available in 40-watt Tulamp and three-lamp ratings, 100-watt Tulamp and Forlamp ratings; developed as an aid to fixture manufacturers in saving critical materials; can be mounted completely exposed atop a shallow wiring channel.

WRITE TODAY for Bulletin GEA-3293 for complete information on G.E.'s material-saving ballasts for MAZDA F lamps from 4 to 100 watts. General Electric Company, Schenectady, New York.

GENERAL ELECTRIC

408-17-5205

BALLASTS FOR FLUORESCENT LIGHTING

Keep Workers ON-THE-JOB with

M·S·A

FEND

BARRIER

To Industrial Skin Irritations

INDUSTRIAL ENEMY NO. 1

Among *all* industrial diseases today, occupational skin irritation is by far the most prevalent—a persistent problem requiring energetic action for its solution. Skin irritations incurred on the job harm health and lower morale among affected workers . . . but this enemy to production can be controlled by proper corrective measures including the use of effective industrial skin creams.

HOW FEND PROTECTS THE SKIN

FEND is rubbed well into the skin, care being taken to cover all exposed surfaces. FEND protects by filling the pores with a bland material and coating the external skin with an invisible barrier through which irritants cannot penetrate. FEND is removed quickly and easily by washing with mild soap and water.

A COMPLETE LINE FOR EVERY HAZARD

Each FEND Cream or Lotion is medically correct and safety-engineered for its specific job of protection—against one or a group of hazards. Whether your dermatitis problems are caused by cutting oils, solvents, caustic solutions, acids, waxes, metals, salts or any of the many-score materials listed in the FEND Brochure, you'll find an immediate protective answer in the complete FEND line. *Write for the detailed story in Bulletin FA-79.*

MINE SAFETY APPLIANCES COMPANY

BRADDOCK, THOMAS AND MEADE STREETS, PITTSBURGH, PA.

District Representatives in Principal Cities

(*Continued from page* 184)

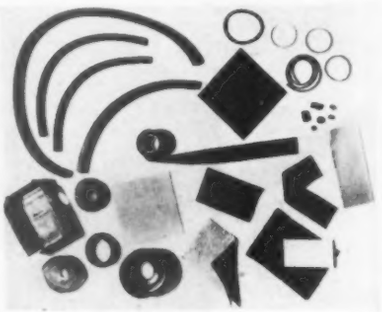
must be stretched to their utmost; fuel oil and gas rationing restrictions must not be relaxed.

Heavy military demands may mean even more severe restrictions.

NEW RUBBER SUBSTITUTE MADE IN PAINT PLANT

A rubber-substitute that can be made in paint factories from vegetable oils and without use of critical materials is announced as suitable for food jar rings, cements, stoppers, erasers, floor mats, tapes and other civilian and war products. Known as Kem-Pol, it was developed by the Sherwin-Williams Company, paint manufacturers.

W. T. Walton, Sherwin-Williams research chemist in charge of Kem-Pol production, states that Kem-Pols are not synthetic rubber, but rather substitutes, replacements and extenders for natural, synthetic and reclaimed rubbers in those cases where lower tensile strength and elongation are permissible.



Kem-Pol Substitutes for Rubber.

A wide variety of war and civilian applications is indicated for the Kem-Pol group, and among the uses suggested by Mr. Walton are treads, mats, hose, braided tubing, pads, erasers, food closures, gaskets, felting, fabric coating, tapes, sealing compounds, adhesives, stoppers and cements.

U. S. GOVERNMENT MANUAL NOW AVAILABLE

The Summer edition of the United States Government Manual, a 707-page reference book on the creation and organization, functions and activities of the Federal Departments and Agencies, is now available, the Division of Public Inquiries, Office of War Information, announces.

The edition contains changes through May 15. Statements on all branches of the Government, a list of principal officials, a separate section on the emergency war agencies, and an appendix on agencies abolished, transferred, or consolidated since 1933 are included in the Manual.

The Manual may be purchased from the Superintendent of Documents, Government Printing Office, Washington, D. C., or at the U. S. Information Center, 1400 Pennsylvania Avenue, N. W. Single copies cost $1; subscriptions covering three editions, $2.75.

SNAP-ON TOOLS HELP ROLL OUT THE TANKS!

Down the assembly lines roll the great M4 tanks . . . 30 tons of grim and deadly destructive power headed for the Axis . . . 30-ton mechanical monsters, mass-produced by the most advanced methods known to industry.

On M4 assembly lines *Snap-ons* are on the job . . . helping speed hand-tool operations on many critical assemblies . . . meeting every requirement for flexibility, precision, power.

In tank arsenals as in every important aviation plant . . . in vast shipyards and in victory geared industry throughout America, Snap-on tools are playing an important part. The 3,000 tools in the Snap-on line are distributed direct to users through 35 factory branches located in key production centers throughout the United States and Canada. Write for catalog and address of the nearest branch.

SNAP-ON TOOLS CORPORATION
8048H 28th Avenue Kenosha, Wisconsin

PERSONALITIES in the NEWS

CELEBRATES 50TH ANNIVERSARY WITH COMPANY

John E. Watkin, Purchasing Agent, Provident Mutual Life Insurance Company, Philadelphia, recently celebrated his fiftieth anniversary with the company—that is, his friends helped him to memorialize the occasion with a luncheon anniversary party, the guests including four vice presidents of the company and members of the Purchasing Department. The party was held in the company's private dining room, and Vice President Andrew J. Davis presided as master of ceremonies, presenting Mr. Watkin with a gift from the company.

In fact Mr. Watkin was the recipient of numerous gifts betokening the goodwill of his fellow employees and the high esteem in which they hold him. These included a handsome mahogany dropleaf table from his associates in the Purchasing Department, a mahogany leather-seated arm chair from a group of other oldtimers of the company; a dozen corncob pipes, tobacco and flowers.

Mr. Watkin started with Provident as an errand boy in 1893, his salary totalling the munificent sum of $3.00 per week. In 1895 he was made assistant in the mail room and took over that department in 1905. In 1910 when a separate Purchasing Department was organized, he was made assistant Purchasing Agent, and in 1927 he was made Purchasing Agent of the company,—an appointment that to him, he says, was the biggest surprise of his life.

John E. Watkin, Purchasing Agent, Provident Mutual Life Insurance Co., Philadelphia, is feted on his Fiftieth Anniversary with the Company.

Byron Cushman is now Purchasing Agent, Rochester office, R. C. Neal Company.

E. H. Miller is Purchasing Agent, butadiene and styrene plants, Ford, Bacon & Davis, Charleston, W. Va.

Harry L. Schofield, Purchasing Agent, Cranston City, R. I. since 1930 recently resigned. Before his appointment as Purchasing Agent he served in the City Council. At a testimonial meeting Mr. Schofield was presented with a traveling bag and brief case.

George Lareida, Purchasing Agent, Spokane County, Wash., in his annual report to the commissioners reveals expenditures of $422,166 for 1942, his purchases ranging from lima beans and lawbooks, to toothbrushes and tractors.

N. C. Johnson, formerly Acting Purchasing Agent, has been appointed Purchasing Agent of the N. C. & St. L. Ry., with headquarters at Nashville, Tenn., succeeding J. L. Woods who is retiring after 46 years of active service.

Edward C. Geissler, State Supervisor of Purchases, Hartford, Conn., recently completed his twenty-fifth year of state service. He started to work for the state in 1918 as Purchasing Agent for the state prison, and was promoted to business manager at the Prison in 1927. In 1937 after "19 years in the prison," he was placed in charge of a centralized department to handle all state purchases.

Lester F. Wallace, former chairman of the Portland (Me.) City Council has been made City Purchasing Agent, succeeding William O. Thompson. Prior to

the appointment he was property control supervisor, New England Shipbuilding Corporation. Mr. Wallace was elected to the City Council in 1926 at the age of 29, being chairman of the Council in 1927-28.

W. F. Sewart has been made assistant sales manager of the Hardware Products Division, Wickwire Spencer Steel Co., with headquarters in the company's home office, 500 Fifth Avenue, New York. Percy Jenkins continues as sales manager of the division.

J. H. Loeffler has been appointed Director of Purchases of Standard Brands, Inc., New York. He has been with Standard Brands and predecessor companies

more than 26 years, having started with the Fleischmann Malting Co. in Chicago. He will continue to handle the purchasing of grains, molasses and other basic raw materials, and will be in general charge of the Purchasing Department. Mr. Loeffler is also consultant to the War Pro-

(*Continued on page* 190)

Now Ready!

THE NEW DARLING VALVE CATALOG FOR ALL INDUSTRIES

with

Complete Up-To-The-Minute General Data and Specifications for use in your Plant Design, Construction, and Maintenance

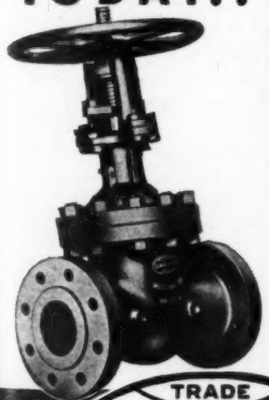
In This Catalog . . .

- Over 500 photographs, sectional views, designs, detailed drawings and other highly interesting illustrations are shown
- Over 300 pages of descriptive data and specifications are indexed and cross-indexed for ready reference.
- More than three years of time and energy have been expended in the creation and completion of this material
- Technical contributions include the finest valve engineering talent available
- A total of more than 125 working days went into one single phase—that of proof reading.
- Each book is registered and recorded in the name of the recipient and his company

THIS new Darling Valve Catalog is actually *more* than a catalog—it's a handbook of informative data and valuable information which you will have occasion to use, time and time again. Compiled and edited only after years of research and practical experience, this book will prove most valuable in the purchase and maintenance of valves in your plant.

You can know in advance what valve designs and materials will best fit your needs for various services. You can know why certain mechanical features make valves last longer—operate easier—give positive shutoff—cost less to maintain. You can also know why so many industries, for so many years, have insisted upon Darling Valves for critical plant installations.

SEND FOR YOUR COPY TODAY. .



It's ready now! Your copy of the new Darling Catalog can be shipped immediately. Simply fill in the coupon and mail to Darling Valve & Manufacturing Co., Williamsport, Pa. There is no obligation.

Darling Valve & Manufacturing Co.
Dept. H,. Williamsport, Pa.

Please send me copy of your new catalog. I am particularly interested in:

- ☐ Corrosion Resistant Valves
- ☐ Cast Steel Valves
- ☐ Special Alloy Valves
- ☐ Check Valves
- ☐ Bronze Valves
- ☐ Fire Hydrants
- ☐ Forged Steel Valves
- ☐ Marine Valves
- ☐ Composition Cups

Name _____ Title _____

Company _____

Address _____

City _____ State _____

TRADE DARLING MARK

VALVE & MANUFACTURING CO.
WILLIAMSPORT, PA.

Because it gives practical time-saving short cuts on 54 essential maintenance jobs, this NEW Oakite DIGEST will prove of invaluable help to your Maintenance Department.

Based on the successful experience of more than a thousand plants, it outlines how Oakite cleaning and de-scaling materials are expediting plant maintenance by conserving man-hours, shortening equipment down-time, speeding up repair and overhaul work, eliminating fire hazards. Write for your FREE copy TODAY!

OAKITE PRODUCTS, INC.
54 Thames Street, NEW YORK, N. Y.
Technical Service Representatives Located in All Principal Cities of the United States and Canada

OAKITE SPECIALIZED CLEANING

(*Continued from page* 188)

duction Board and Defense Supplies Corporation on molasses and alcohol.

E. A. Marples has been appointed Purchasing Agent in charge of new purchasing office established at Edmonton, Alberta, Can., by the Canadian National Railways.

George E. Kennedy has been appointed Purchasing Agent for the Thrift unit of Kendall Co., Paw Creek, N. C., succeeding Maurice L. Clemence.

T. Wesley Eyres. As announced in the July issue of Purchasing, Mr. Eyres has

been appointed Purchasing Agent of Mandel Brothers, one of Chicago's leading mercantile houses.

Forrest W. Carroll, formerly Assistant Purchasing Agent of the Boston Elevated Railway Company, Boston, Mass., was appointed Purchasing Agent, effective July 1. Mr. Carroll joined the Railway Company in September 1909, and has been in continuous service in the Purchasing Department up to the present. He is a resident of Milton, Mass. During World War 1 he served with the 33rd balloon company.

William S. Harris has been appointed Purchasing Agent and Leonard C. Zarpentine has been made Assistant Purchasing Agent, U. S. Tobacco Company, New York.

Frank H. Dunn, has been promoted from executive vice president to president of the H. F. Wilcox Oil & Gas Co., Tulsa, Okla. He has been with the Wilcox organization for 24 years in various capacities including that of Purchasing Agent. He served as president of the Purchasing Agents Association of Tulsa for the 1927-28 term.

C. H. Ingram, Purchasing Agent for the City of Greensboro, N. C., is reported to have tendered his resignation.

Capt. Robert A. Shotwall, Jr., is reported to be in charge of Purchasing Office for the Navy, recently opened in Chicago. He formerly headed the Purchasing Di-

(*Continued on page* 197)

HA-HA! HE THOUGHT A SNAKE BIT HIM! I DON'T SEE HOW A GUY COULD BE ABSENT-MINDED ENOUGH TO THINK THAT A SNAKE WOULD BE IN A BIG MODERN PLANT LIKE THIS!
THAT'S JUST TH' REASON! IT'S SO MODERN THAT ONLY A FEW MONTHS AGO WE WAS PICKIN' WILD BERRIES RIGHT ABOUT HERE -- AND THERE WAS SNAKES IN TH' BUSHES!
T. M. REG. U. S. PAT. OFF.
COPR. 1943 BY NEA SERVICE, INC.
MEMORY LANE
J.R.WILLIAMS
3-5

THAT WAS THE DAY HE TALKED THE BOSS INTO "CHIP BREAKERS."

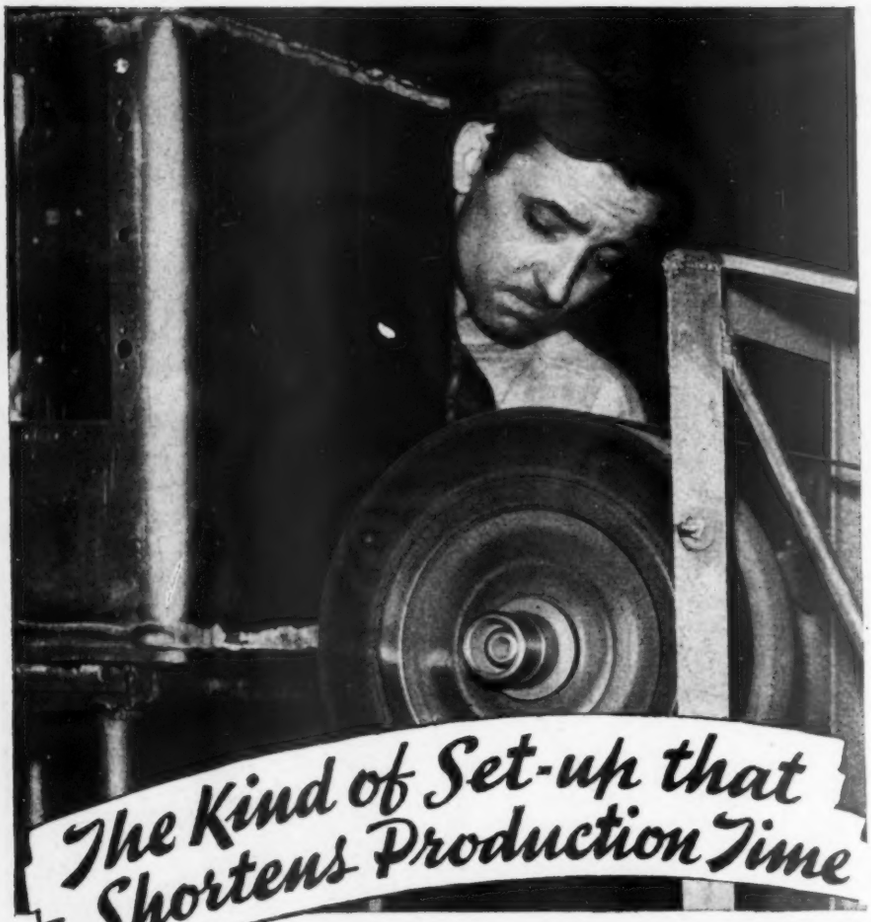
Chip Control avoids dangers and delays caused by long, hot, tough chips of alloy steel. Chip Control yields **short chips** that are more marketable, bring a better price, and provide a means for speedy recovery of alloys on a national scale.

For a proved method of producing **short chips** with Firthite Sintered-Carbide Cutting Tools, refer to pages 41, 42, and 43 of the Firthite Users' Handbook. Ask for Handbook FE-101.

ARMY E NAVY

Firth-Sterling
STEEL COMPANY

Offices: McKEESPORT, PA. - NEW YORK - HARTFORD - PHILADELPHIA - CLEVELAND - DAYTON - DETROIT - CHICAGO - LOS ANGELES



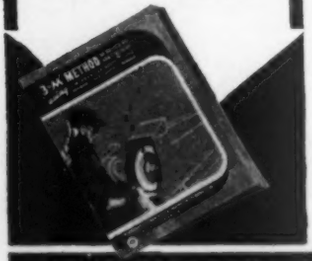
The Kind of Set-up that Shortens Production Time

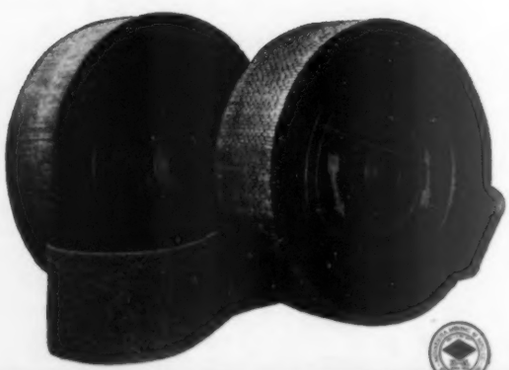
3-M ABRASIVE BELTS and Segment Face Wheels

Where tools, small parts and other irregular shaped articles must be given a quick, smooth finish, a Backstand Idler equipped with a 3-M ABRASIVE BELT and Segment Face Contact Wheel meets every demand for speed . . . quality . . . efficiency. The Segment Face Wheel conforms to the surface being finished. The fast-cutting 3-M ABRASIVE BELT makes short work of deburring, removal of weld flashings, tool marks, and countless other grinding and finishing operations. For more complete information on this high-speed precision process and its application to your finishing problems, return the coupon today for a FREE copy of our 3-M METHODS booklet.

Send for this FREE BOOKLET

Gentlemen: P 843
Please send me a FREE copy of your booklet on 3-M Grinding and Finishing METHODS.
Name.....
Department.....
Company.....
Address.....
City.....Zone.....
State.....





MINNESOTA MINING & MFG. COMPANY
SAINT PAUL 6, MINNESOTA

(*Continued from page* 190)

vision of the Naval Air Factory in Philadelphia. The Chicago office it is said handles purchases for naval bases all over the world, and acts for the Bureau of Supplies and Accounts to buy practically all the Navy materials produced in the Middle West. The new office takes over the purchasing previously handled by the Ninth District Supply Office at Great Lakes. It is located in the Field Building, Adams & La Salle streets.

Frank F. Price after 35 years' service as business and Purchasing Agent of the Bay City, Mich. public school system, recently retired. Mr. Price is 70 years old and had been affiliated with the public schools in Bay City for 45 years.

William A. McCurdy has been appointed Assistant Director of Purchases, Dominion Rubber Co., Ltd., Montreal, Can.

Charles F. Fullerton, assistant editor "The Canadian Purchaser," and secretary, Council of Canadian Purchasing Agents Associations, is now with the R. C. N. V. R.

AMONG THE PEOPLE YOU BUY FROM

Roy Stevens, executive assistant, International Business Machines, and L. H. LaMotte, manager of I. B. M. Washington office, were recently elected to fill two newly created vice presidential offices.

W. K. Page has resigned as vice president and general manager of Addressograph-Multigraph, to become associated

with Wassell Organization of Westport, Conn., manufacturers of Produc-Trol production control and records equipment. He is a former president of the National Office Equipment Manufacturers Institute.

Jessop Steel Co., Washington, Pa., announces the appointment of Fred J. Wood as District Manager of Jessop Steel Co., Ltd., 530 Front St., W., Toronto, Ont.

Commissions in the U. S. Armed Forces apparently come naturally to the uniformed men from National Starch Products' New York headquarters. On the roster of 22 names representing the New York office alone, are two captains, seven

(*Continued on page* 194)

NEW Wakefield COMMODORE
INDUSTRIAL UNIT

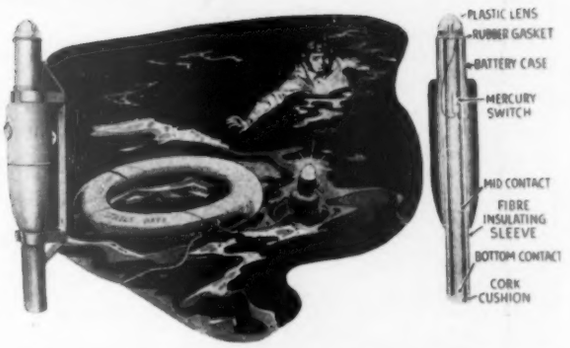
Highly efficient!

Plaskon... Saves Steel!

For war plants that need better light, here's a "conservation" answer

- New COMMODORE Industrial unit gives 86% of light from bare bulb . . . 75% down on the job . . . by E.T.L. test.
- Plaskon reflector means light weight.
- Only 13 oz. of steel . . . helps WPB conservation.
- Gives light up, as well as down.
- No dark ceilings; no eyestraining contrasts.
- One of the most efficient industrial units known.
- Easy to clean . . . easy to handle.
- For lamps from 200 to 500 watts.

Write for details



Developed in cooperation with the Navy, this unit made by Wakefield provides important help at night . . . for those accidentally hurled overboard or to flyers down at sea. It lights up when it hits the sea and locates life saving equipment in the dark.

For outstanding war production . . . made possible through the untiring efforts of our men and women who make equipment which has helped save fighting ships and men.

ARMY E NAVY

THE F. W. Wakefield BRASS COMPANY

RED SPOT LIGHTING FOR COMBAT OPERATIONS AND WAR PRODUCTION

VERMILION, OHIO

WHEN AIR BATTLES HINGE ON *Fast* REFUELING . . .

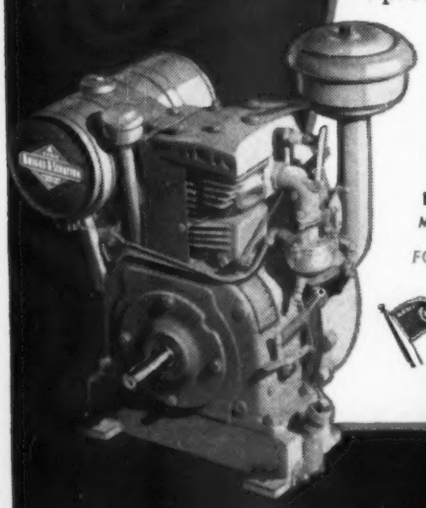
Fighting planes require fast refueling and service. Every minute counts. Pumping units, powered by small gasoline engines, provide faster servicing of planes. Here again, some of the hundreds of thousands of dependable, instant-starting Briggs & Stratton engines, now serving our armed forces, are on combat duty.

Meeting wartime demands for Briggs & Stratton gasoline engines has proved a BIG JOB. But we like big jobs. In fact, we'd like to see just how big a job we can handle with our facilities for high quality, precision production.

We will welcome the opportunity of discussing your 4-cycle, air-cooled gasoline engine requirements — either for immediate or post-war needs.

BRIGGS & STRATTON CORP.
MILWAUKEE 1, WISCONSIN, U. S. A.

FOR VICTORY BUY WAR BONDS



4 CYCLE
BRIGGS & STRATTON
GASOLINE ENGINES

(*Continued from page* 192)

lieutenants, four lieutenants junior grade, and five ensigns—a batting average of .818. National's service roll for its entire organization numbers 111 names.

Sylvania Electric Products, Inc., as the first step toward preparation for increased world-wide operation, announces the formation of an International Division with Walter A. Coogan as Director.

John E. Zollinger, formerly manager of the Cleveland office of International Busi-

ness Machines, has been appointed Eastern sales manager.

The York Ice Machinery Corp., announces change of name to the York Corporation.

The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc., Passaic, N. J., for the third consecutive year has been awarded first prize for the best business paper advertising compaign, by the National Advertising Agency Network. It also gave Manhattan second award in the employee relations section.

T. W. Pennington, Sales Manager, Jessop Steel Co., Washington, Pa., announces the addition of a new technical staff specializing in individual classes of materials. It is made up of John R.

Jessop Technical Sales Staff
Seated: J. R. Harbaugh, H. E. Doughty, R. P. J. McCarty; Standing: W. E. Wilson, John Walker, E. H. Dau

Harbaugh, metallurgical sales engineer, special applications of alloy tool and die steels; H. E. Doughty, assistant general sales manager, high speed tool steels; R. P. J. McCarty, special stainless representative for the New England, New York, Buffalo and Philadelphia territories; W. E. Wilson, specialist in stain-

(*Continued on page* 196)

17 YEARS IS A LONG TIME

Best evidence of the fundamental soundness of any product is the length of time it has given satisfactory and economical service.

Typical of the many Textolite plastic products which have proved their worth in industry are laminated spinning buckets. Since 1926, the performance of these buckets has demonstrated their superior qualities.

The number of Textolite spinning buckets in use has increased each year even though their inherent characteristics make them outlast other types.

Industrial applications in which General Electric Textolite can be used economically and advantageously have expanded year by year. New plastic materials, improved molding techniques and a growing fund of plastics engineering "know how" are constantly expanding the usefulness of plastics.

General Electric, the nation's largest plastics manufacturer, is prepared to put at the disposal of any industry the facilities of its plastics plants and the knowledge of its personnel. Whether the product you build is a spinning bucket, an electrical device, a milking machine, or a steel mill, plastics can be used to improve its quality and performance.

For further information, write section C-8, One Plastics Avenue, Pittsfield, Mass.

BUY WAR BONDS

Listen to the news on the WORLD TODAY each weekday evening, CBS, 6:45 E.W.T. On Sunday, listen to the HOUR OF CHARM on NBC, 10:00 P.M. E.W.T.

PLASTICS DIVISIONS

GENERAL ELECTRIC

PD-8

2 STARS YOU CAN STEER BY

In selecting hack saw blades, you can safely "steer by the stars", making sure you see the STAR trade mark which appears on the genuine Clemson-made product.

This STAR for SPEEDY SAWING

When the job calls for high speed sawing, call for STAR "Moly"*, the original molybdenum alloy hack saw blade. You can tell it by its copper-color finish, a patented feature.

STAR MOLY HIGH SPEED

STAR UNBREAKABLE SPECIAL FLEXIB

This STAR for DIFFICULT SAWING

With a STAR Unbreakable Special Flexible, you get a standard alloy blade that cuts like an all-hard, eliminating breakage in use and resisting stripping of teeth. You can tell it by its patented green finish.

CLEMSON BROS.
INCORPORATED
MIDDLETOWN • NEW YORK

*T. M. Reg. — Blades bearing the name "Moly" are made only by Clemson Bros., Inc. and affiliated companies

Makers of STAR Hack Saw Blades, Frames, Band Saws, and Clemson "33" Lawn Machines

4024

(*Continued from page* 194)

less, with headquarters in Chicago, covering the Chicago, Indianapolis, Detroit, Cleveland, and Cincinnati territories; John Walker, special composite steel representative; and E. H. Dau, special sheet and plate representative exclusive of solid stainless and Stainless.

Joseph L. Mullin has been appointed general superintendent of foundries for the American Manganese Steel Divn. of the

American Brake Shoe Co., with headquarters at Chicago Heights, Ill. W. F. Kelly succeeds Mr. Mullin as works manager at New Castle, Del.

Dr. R. P. Dinsmore has been elected vice president in charge of research and development, Goodyear Tire & Rubber Co., Akron, Ohio.

E. E. Aldous, president, United States Steel Supply Co., a United States Steel Corporation subsidiary, announces the purchase of the physical assets of Moise Steel Company of Milwaukee, Wis. The Supply Company will continue the steel warehouse business of the Moise Steel Co. in Milwaukee. Carl Gallauer, formerly vice president of Moise Steel Co. has been appointed district manager, and J. R. Beers, has been appointed assistant district manager.

James E. MacMurray, founder and former chairman of the board of Acme Steel Co., Chicago, passed away recently at Pasadena, Calif. He held the presidency of Acme for 38 years. He was 80 years old.

Archer & Smith Ltd., is new name of the Hub Tool Co., Lexington, Ky., makers of precision cutting tools.

C. B. Cook, director of the Elwell-Parker Electric Co., Cleveland, Ohio, has been appointed vice president in charge of advertising, sales promotion, and export sales. He has been identified with the company for the past 28 years.

H. B. Hodgins has been named manager of the Spokane office of the Westinghouse Electric & Mfg. Co. He has been application engineer in the Spokane area since 1935.

W. F. Dashiell, is now Southern District Sales Manager, Richmond, Va., Boston Woven Hose & Rubber Company, Boston, Mass.

Wm. S. Richardson, general manager of the industrial products sales division, The B. F. Goodrich Co., Akron, Ohio, has been elected chairman of the OPA

(*Continued on page* 198)

Handle Heavy, Bulky Loads with Simplex Geared Jacks!

No. 126 and 127 have right and left-hand toe lifts respectively. Lift 25-tons. Height: 27½", lift: 12½". No. 125 lifts on cap only.

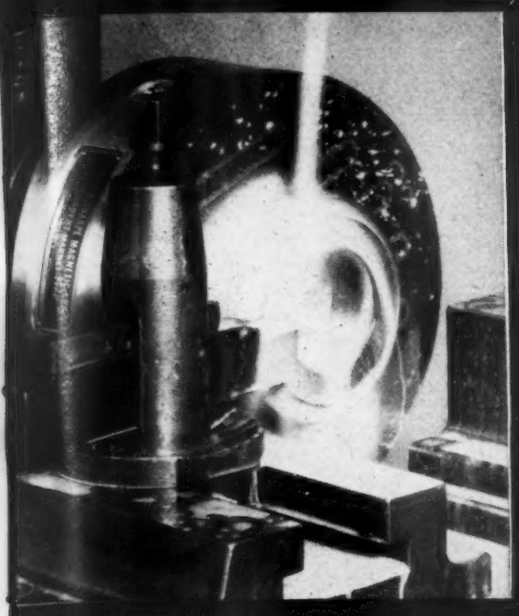
50% to 90% of production is handling. Powerful Simplex Geared Jacks handle heavy parts and machines through production to final shipment. For rigging and installing machinery, too. Available in 35-ton capacity with cap lift only.

Templeton, Kenly & Co., Chicago (44)
Better, Safer Jacks Since 1899

Make Your Jacks Last Longer!

Proper lubrication, care and handling will do it.
Send for bulletin on care of jacks.

Simplex
LEVER - SCREW - HYDRAULIC
Jacks



Just Put Chuck on Machine · and Start Work

.....No AUXILIARY EQUIPMENT

is needed with

PERMANENT MAGNET TYPE

MAGNETIC CHUCKS

—because Permanent Magnets Provide the Holding Power

No complicated installations are required when you use Brown & Sharpe Magnetic Chucks of the Permanent Magnet Type. No special preparations are necessary — no wiring — no auxiliary current supply or generators. Simply place the chuck on the machine where it is to be used and commence work. Small sizes are transferred easily from machine to bench for hand operations.

Perhaps Brown & Sharpe Magnetic Chucks would help you in maintaining your production quotas in the armament program. Or their efficiency and simplicity of operation might aid in a saving of manpower. Complete range of sizes for all ordinary requirements. Magnetic chuck catalog sent on request. Brown & Sharpe Mfg. Co., Providence, R. I., U. S. A.

NO WIRES—NO HEATING—NO OPERATING COSTS

UPPER, 9" Rotary Model No. 9R holding work for light turning in lathe. This chuck, while especially suited for grinding operations, can be used for other light machine work.

LOWER, Rectangular Model No. 1236. This 12" x 36" chuck, the largest stock size in the line, is suited for large work or for groups of duplicate parts.

We are proud to be honored with the Navy "E", awarded for outstanding accomplishment in Defense production.
Brown & Sharpe Mfg. Co.
Providence, R. I., U. S. A.
BS

For sale only in the U. S. A. and its Territories and in Canada.

BROWN & SHARPE

WE DELIVER ON TIME

Yes

No holding up vital jobs while you wait for your grinding wheels or mounted wheels.* Timing and scheduling are everything now. That's why our streamlined QUICK SERVICE is such an important asset.

Fully approved and endorsed by W P B, here's our wartime speed setup:

- Manufacture only wheels 3″ in diameter and under. To speed production, larger sizes are eliminated for the duration.
- No quitting whistle. We are on the job making wheels 24 hours a day, every day.
- Our central location brings us closer to many plants. No time lost in transfer connections or long distance shipping.

CHICAGO GRINDING WHEELS

The wheels of proved quality — known for performance, cutting and long life. Any shape, grain and grade, any size up to 3″ in diameter. From this army of wheels you can select one custom built for your job.

TRY ONE—Tell us the kind of equipment, the job, and size wheel you want to try. We'll send it postpaid.

Catalog Mailed on Request

AMERICA'S HEADQUARTERS FOR MOUNTED WHEELS SMALL GRINDING WHEELS

CHICAGO WHEEL & MFG. CO.

118 S. Aberdeen St. Chicago, Ill.

*Half a century of specialization has established our reputation as the Small Wheel People of the Abrasive Industry. You can bank on us.

Send Catalog. 118-7

Interested in
☐ Grinding Wheels
☐ Mounted Wheels
☐ Send Test Wheel
Size.....

Name .....

Address .....

(*Continued from page* 196)

Mechanical Rubber Goods Industry Advisory Committee.

Frank C. Mahnke, Jr., has been appointed advertising manager for All-Steel-Equip Co., Aurora, Ill.

F. Doyle Bowers has been appointed district field Engineer for the Tennessee

and Eastern Arkansas territory, Republic Rubber Division, Lee Rubber & Tire Corp., Youngstown, Ohio. His headquarters are in Memphis, Tenn.

Universal Electric Co., Peoria, Ill., has been appointed distributor of General Electric radio transmitter, industrial, power, and special purpose electronic tubes. Karl Boggess is president of the company.

Brown Instrument Co., Philadelphia, Pa., subsidiary of Minneapolis-Honeywell Regulator Co., announce the appointment of George M. Muschamp and Paul L. Goldstrohm as vice presidents. Mr. Muschamp will be in charge of engineering and Mr. Goldstrohm will be in charge of production.

William B. Gillies, vice president in charge of operations of the Youngstown Sheet & Tube Co., and president of the Youngstown Ohio Chamber of Commerce,

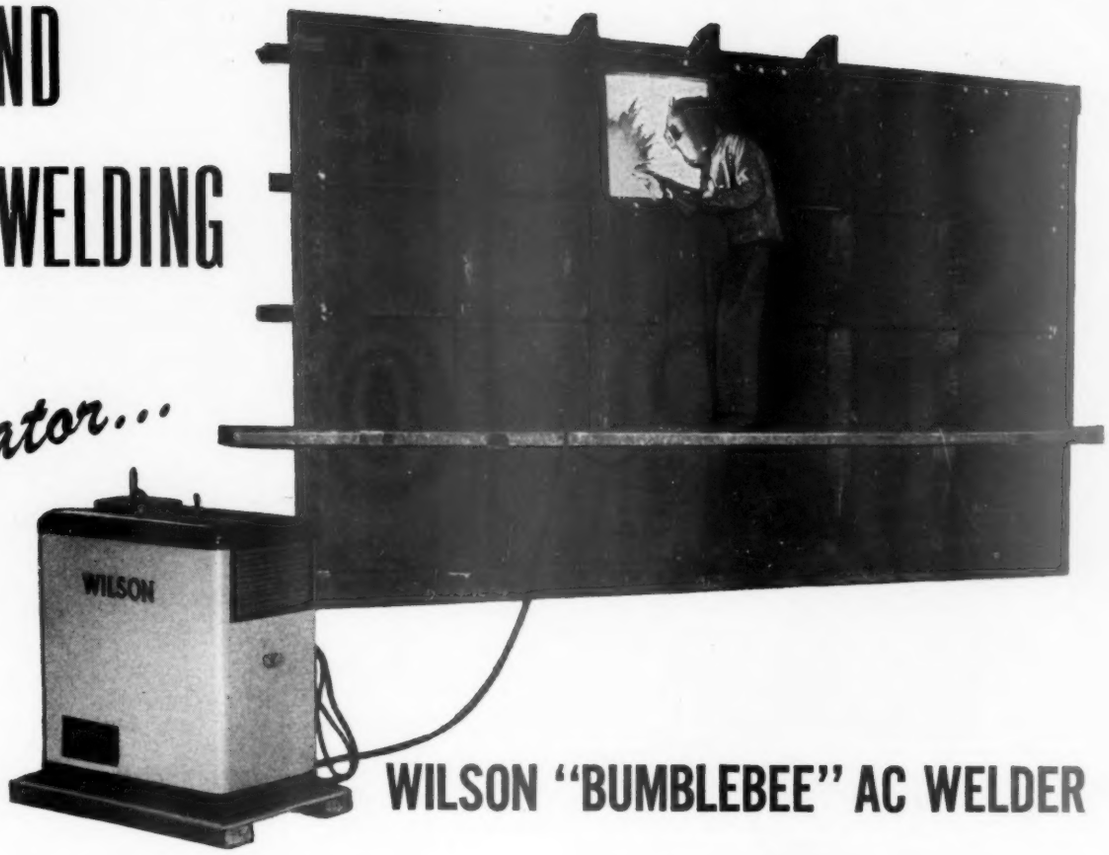
passed away recently after a heart attack. He began his expansive career in the steel industry immediately after his graduation from college as foreman for the Illinois Steel Company in 1904. He became president of the Youngstown Steel & Tube Company in 1933.

W. S. Richardson, general manager, Industrial Products Sales Division of the

(*Continued on page* 200)

MORE AND BETTER WELDING

Per Operator...



WITH THE WILSON "BUMBLEBEE" AC WELDER

If you're looking for 15-25% faster welding with improved weld deposits, use the Wilson "Bumblebee" AC Welder. This new AC welding machine helps you save in three important ways:

1. *Save Power* as much as 40% because there's no idling loss with AC machines.
2. *Save Time* through the use of larger electrodes and heavier welding currents.
3. *Save Electrodes* because the bigger electrodes used with AC mean fewer stubs in a given length of weld.

In addition, the Wilson "Bumblebee" can be delivered sooner than equivalent DC machines because it requires much less sheet steel and copper. Maintenance, too, is simplified because there are no heavy rotating parts on the "Bumblebee".

Made in 300 and 500 ampere sizes, the "Bumblebee" may be equipped with wheels for extra portability at small additional cost. Write your nearest Air Reduction office for complete details.

AIRCO No. 230 AC ELECTRODE

For superior AC welding *in all positions* use Airco No. 230. Thanks to its special coating, its spraying action and stronger arc, Airco 230 gives faster and better welding in the flat, vertical or overhead positions. Available in 1/8" and 5/32" diameters, 14" length. Write any Air Reduction office for details.

Air Reduction

Buy United States War Bonds

General Offices: 60 EAST 42nd ST., NEW YORK 17, N. Y.

IN TEXAS: MAGNOLIA-AIRCO GAS PRODUCTS CO.

General Offices: HOUSTON, TEXAS

AIRCO WILSON

IDLE CYLINDERS ARE PRODUCTION SLACKERS: *Keep 'em rolling for victory!*

How to Cut Lighting Maintenance Time

The "Watch Dog," newest in the G-E line of fluorescent lamp starters, does not have to be removed every time a dead lamp is replaced—it remains in the fixture, ready to start the new lamp. This reduces the time spent in lighting maintenance. Further, it permits immediate replacement of dead lamps because no "cooling" period is required.

What's more, the "Watch Dog" is a precision lamp starter and a dead lamp stopper that ends blinking and flickering. Precision starting adds greatly to lamp life because it uses a minimum of emission material so vital to long lamp life.

For additional data send the coupon below.

Section G831-77
Appliance and Merchandise Dept.
General Electric Company
Bridgeport, Conn.

Gentlemen: Please send me additional information about your new FS-40 "Watch Dog" Starter.

Name .....
Company .....
Address .....
City ..... State .....

GENERAL ELECTRIC

(*Continued from page* 198)

B. F. Goodrich Co., announces the following appointments: Chester F. Conner, merchandise manager; Jay E. Miller, sales promotion manager, and Harold F. Mosher, manager, special industrial merchandise.

Ernest Muller has been appointed assistant to Mark A. Follansbee, vice president in charge of sales, Follansbee Steel Corp., Pittsburgh, Pa. Mr. Muller will devote a major part of his efforts to the company's post-war objectives.

Aircraft Accessories Corp., will soon occupy its eighth plant in the Kansas City, Kans. area. In addition to these plants, the company has three in Burbank, Calif., and three in Slater, Mo.

Frank H. Robb, formerly of Springfield, Mass., has been named manager of the Manufacturing and Repair department, Westinghouse Electric & Mfg. Co., for the Los Angeles area, succeeding Charles G. Yarbrough who has retired.

J. L. Mauthe has been appointed vice president in charge of operations of the Youngstown Sheet & Tube Company, succeeding the late Wm. B. Gilles. Albert S. Glossbrenner succeeds Mr. Mauthe as superintendent of the Youngstown district.

ARMY-NAVY "E" AWARDS

The U. S. Maritime Commission has again honored the men and women of the Homestead Valve Manufacturing Co., Corapolis, Pa., by awarding a gold star for their Maritime "M" pennant.

International Industries, Inc., Ann Arbor, Mich., announce receipt of the Army-Navy "E" pennant at its optical division, plant 2.

Resinous Products & Chemical Co., Philadelphia was recently awarded the Army-Navy "E" flag, and employees presented with "E" pins, at the company's Bridesburg Plant. Keynoting the award ceremony, Lt. Col. Don A. Starry, Army

(*Continued on page* 202)

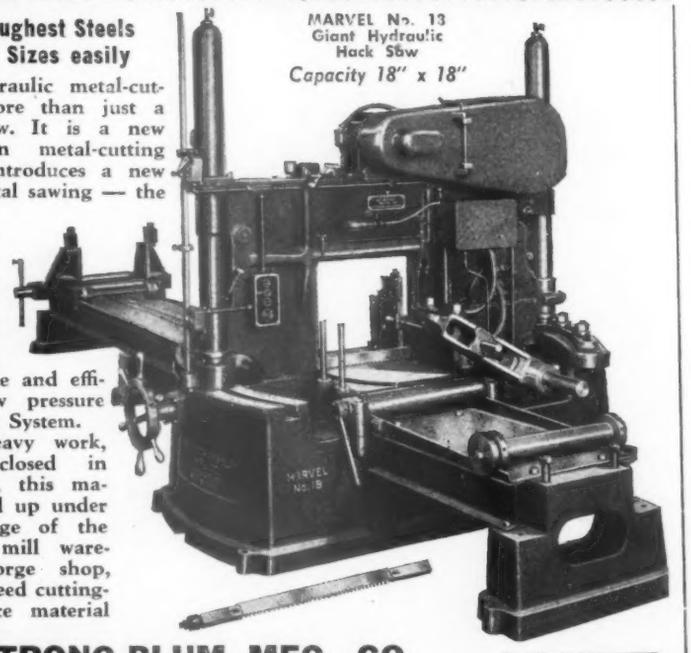
MARVEL SAWS

CUTS the Toughest Steels and Largest Sizes easily

This giant hydraulic metal-cutting saw is more than just a larger hack saw. It is a new development in metal-cutting methods that introduces a new principle of metal sawing — the Roll-stroke blade action makes it possible to cut the toughest steels in the largest sizes easily and rapidly. It also permits a simple and efficient, very low pressure Hydraulic Feed System.

Built for heavy work, completely enclosed in heavy housing, this machine will stand up under the rough usage of the average steel mill warehouse and forge shop, where it will speed cutting-off, and reduce material loss.

MARVEL No. 13
Giant Hydraulic
Hack Saw
Capacity 18" x 18"



ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
5700 Bloomingdale Ave., Chicago, U. S. A.
Eastern Sales Office: 225 Lafayette St., New York

Write for Catalog

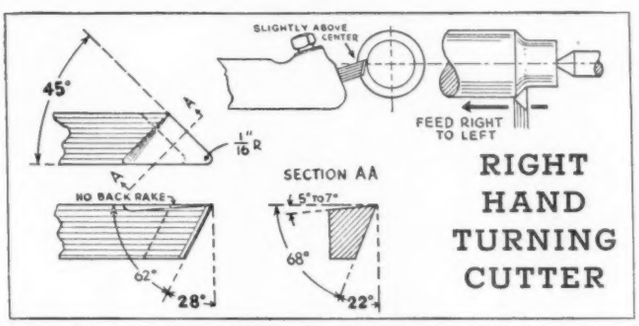
HOW AND WHY

WILLIAMS' TOOLS AID WAR PRODUCTION

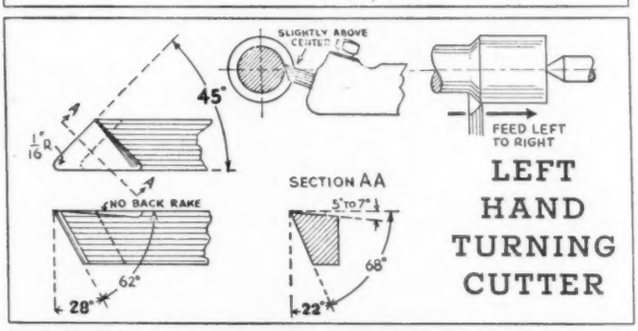
GRINDING CUTTERS FOR WILLIAMS' TOOL HOLDERS

DATA SHEET A, covering Turning, Cutting-Off and Threading Tools for machining cast iron and steel.

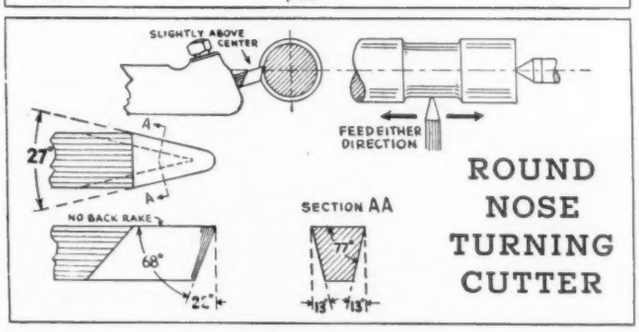
● Since a correctly-ground cutter bit is essential to good lathe work, the following instructions are offered to users of Williams' Tool Holders as representing our recommended practice for general machine work with the high speed steel cutters furnished with Williams' Holders. If, after grinding, cutting edges are honed with an oil stone the bit will cut better and last longer.



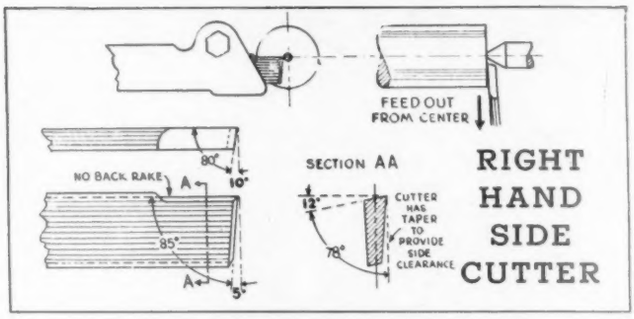
RIGHT HAND TURNING CUTTER



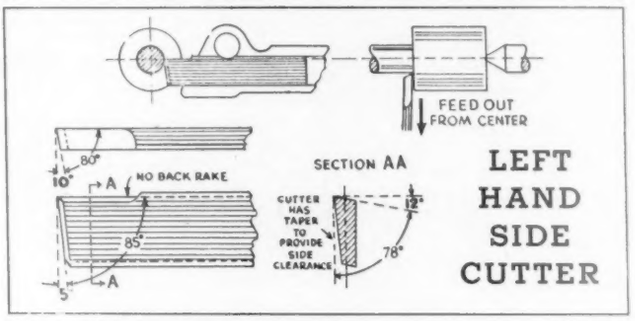
LEFT HAND TURNING CUTTER



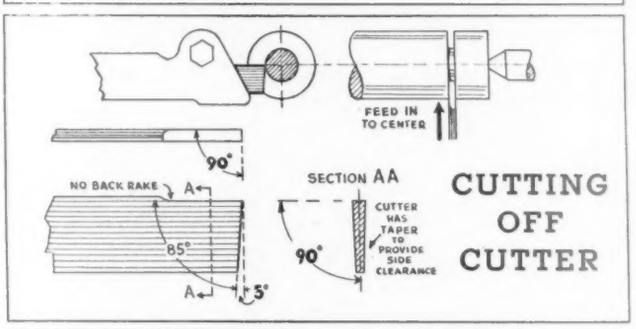
ROUND NOSE TURNING CUTTER



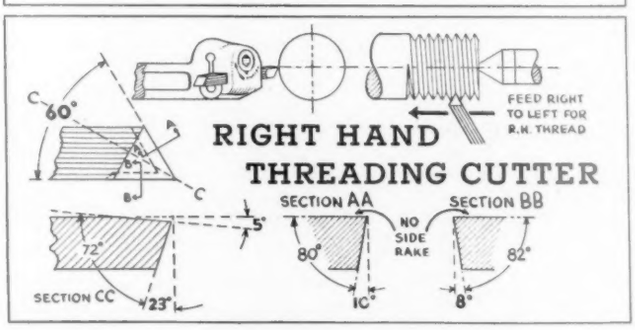
RIGHT HAND SIDE CUTTER



LEFT HAND SIDE CUTTER



CUTTING OFF CUTTER



RIGHT HAND THREADING CUTTER

Additional Data Sheets on the subject of grinding other cutters for Williams' Tool Holders will follow.

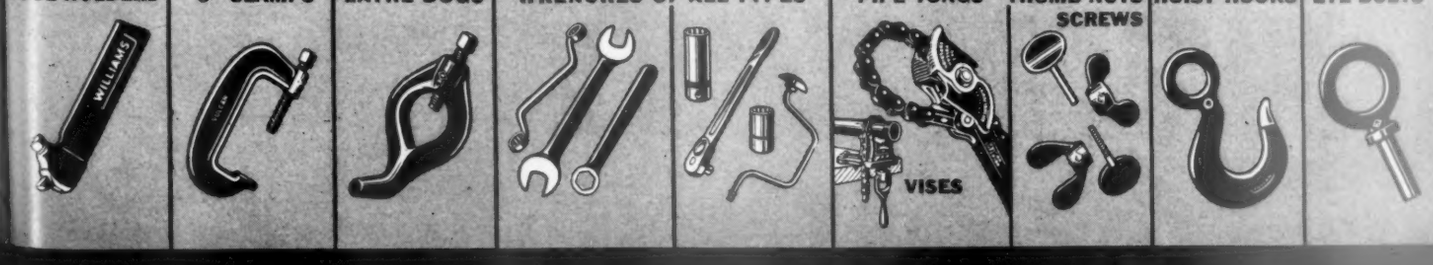
WILLIAMS
SUPERIOR DROP-FORGED TOOLS
Headquarters
for over half a century for
DROP-FORGINGS and DROP-FORGED TOOLS

Sold by Leading Industrial Distributors Everywhere

J. H. Williams & Co., Buffalo, N. Y.

© J. H. W & CO., 1943

TOOL HOLDERS | "C" CLAMPS | LATHE DOGS | WRENCHES OF ALL TYPES | PIPE TONGS | THUMB NUTS SCREWS | HOIST HOOKS | EYE BOLTS



LOOK OUT FOR THAT 3RD STRIKE..

It's the one that puts the cable, machinery, and valuable copper out of the game. Don't let this happen in your plant. Follow the simple rules for cable care. Post them in a conspicuous place where your workmen can see them every day.

DRAGGING— Never drag a cable. Coil it carefully before attempting to move it. It doesn't take long, yet it does add extra years of operating life to the cable.

MOISTURE— Keep cable out of moisture whenever possible, both when in use and out of use. Just a flick of the wrist is often all that is required to move cable out of a puddle of water. A minute or two is well spent when used to roll a cable reel into a sheltered place.

ABRASION— Avoid unnecessary abrasion which will cause disintegration of cable sheath and shorten cable life, or result in short circuits causing production stoppage.

"TOW LINE"— Electric cable and wire were not designed for use as tow lines for hauling equipment to the place where it is to be used. This will strain the cable, damage it at point of connection to the equipment.

Don't allow cable to kink. If this does happen however, remove the kinks carefully and immediately to prevent damage to the cable sheath. Keep cable out of sun, away from heat such as steam lines and furnaces. Excessive heat ages rubber rapidly, cuts down cable life. Repair cuts, nicks and damaged places on cable sheath immediately. Guard against overloading cable. Don't allow heavy equipment to run over cable.

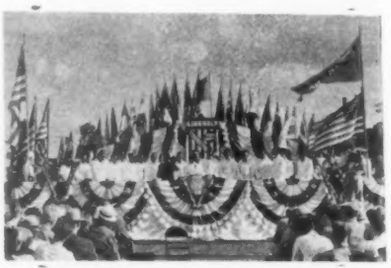
JOHN A. ROEBLING'S SONS COMPANY
TRENTON, NEW JERSEY *Branches and Warehouses in Principal Cities*

ROEBLING JAR ROEBLING

(*Continued from page* 200)

Air Corps, declared that workers are part of this nation's fighting force just as surely as if they were part of the army on land, on sea, or in the air, and repeated the biblical admonition "Hold fast that which thou hast, that no one take thy crown" as being as timely today as when first given.

The Army-Navy "E" pennant for excellence in production now waves over the Ewart plant of Link-Belt Co. in Indianapolis, and the plant's productioneers are wearing "E" pins. The flag and pins were presented at recent ceremonies at which



Ceremonies at Link-Bell Ewart Plant.

approximately 6,000 employees, relatives and friends were present. The Link-Belt Glee Club sang numbers and at the conclusion of the program led the audience in singing "God Bless America".

The Philco Corporation announces that its Simplex Radio Division, Sandusky, Ohio, has been awarded a white star to add to its Army-Navy "E" flag. This is the fourth star award to Philco Corporation plants.

The F. W. Wakefield Brass Co., Vermillion, Ohio, and its employees recently took part in colorful ceremonies attending the presentation of the Army-Navy "E" burgee and merit pins.

The H. M. Harper Co., Chicago, now flies the Army-Navy "E" flag with one white star, the award being presented by Admiral A. M. Charlston, U. S. N.

Armstrong Cork Co., Lancaster, Pa., announces that its two Lancaster plants have been awarded a white star to be added to the Army-Navy "E" flag awarded November 30.

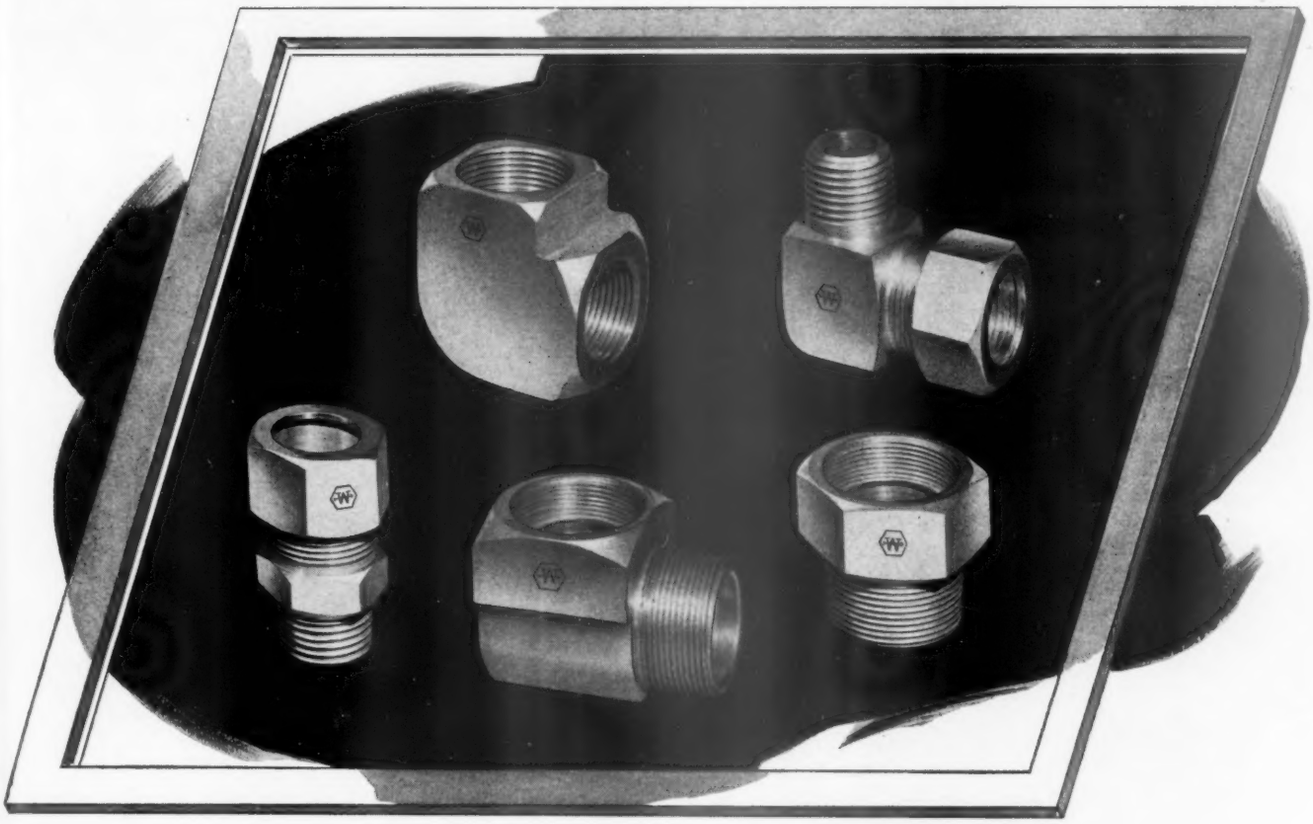
As a help to those who have the responsibility of ordering programs, invitations, etc. for Army-Navy "E" ceremonies, R. O. H. Hill, Inc., 270 Lafayette St., New York 12, N. Y., has issued a booklet of brief suggestions designed to save executive time in the preparation of programs and ceremonies.

* * *

WARTIME PACKAGING CATALOG

The new 1943 PACKAGING CATALOG furnishes a review of a year and a half of packaging goods for war, and under war time conditions. Based on firsthand information gathered in hundreds of packaging plants and on the fighting fronts, the new volume features illustrations of the many ingenious packages developed to pack munitions, soldiers' and sailors' rations, ordnance, and

(*Continued on page* 204)

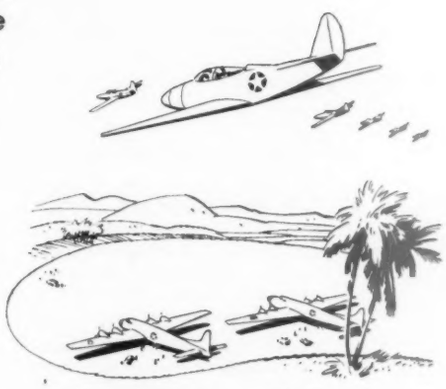


Look ahead with Weatherhead

• The Weatherhead Hex with the Weatherhead arrow is the mark of quality of the world's largest manufacturer of fittings and flexible hose assemblies.

Relying upon the Weatherhead mark of quality for accuracy, dependability and ease of installation, automotive, aviation, machine tool and refrigeration industries are "Looking ahead with Weatherhead" in today's global warfare as well as the progress which peace will surely bring.

Typical of Weatherhead production for industry are Weatherhead patented inverted, S A E, and compression tube fittings for industrial, automotive and refrigeration installations.



THE WEATHERHEAD COMPANY • CLEVELAND, OHIO
Branches: **Detroit • Los Angeles • New York • St. Louis**

Weatherhead

WORLD'S LARGEST PRODUCERS OF FITTINGS AND FLEXIBLE HOSE ASSEMBLIES

PLANTS IN CLEVELAND, OHIO • COLUMBIA CITY, INDIANA • LOS ANGELES, CALIFORNIA • ST. THOMAS, ONTARIO, CANADA

JOHNSON XLO Music Wire

HIGH grade steel spring wire in constant demand by makers of experimental parts, tool and die workers, many others. XLO Music Wire comes to you in familiar red and silver packages in units of ¼ lb., ½ lb., and 1 lb., as well as 5 lb. packages and catchweight coils. Wire sizes from .005" to .200" dia.

JOHNSON STEEL & WIRE CO., INC.
WORCESTER ★ MASSACHUSETTS.
NEW YORK ATLANTA AKRON CHICAGO LOS ANGELES

Materials...
Machines...
Men...and...
PRODUCTIMETERS

Four essentials united...with tremendous driving power . . . to produce in never before achieved quantities, to win the Victory on the production front.

Productimeters automatically record machine production...strokes or revolutions ...measure lineal feet or yards...set machines for making precision tools. They are designed for speed and accuracy ...constructed for hard usage ...they'll save you precious time and man-hours.

Every purchasing department should have Productimeter literature on file.

Catalog and prices on request!

DURANT MFG. CO.
1959 N. Buffum St. Milwaukee, Wis.
159 Eddy St. Providence, R. I.

They Withstand Today's Ruinous Pace

Fairbanks Reinforced Hand and Platform Trucks are veritable fortresses for strength and durability. Fairbanks Platform Trucks are practically everlasting because, if the boards become damaged, they can be replaced quickly and cheaply by removing a few bolts. No welding or cutting is necessary.

Every part of Fairbanks Trucks subject to excessive wear can be renewed.

Write for catalog No. 51-52.

THE FAIRBANKS COMPANY
393 Lafayette St., New York, N. Y.
Boston, Mass. Pittsburgh, Pa.
Distributors in Principal Cities.

Fairbanks

(Continued from page 202)

civilian supplies. The many substitute containers and packaging materials, especially developed to meet wartime shortages, are also illustrated and analyzed in thoroughgoing detail.

The opening article in the section—"Package Planning In Wartime"—is titled "Military Packaging" and is written by Frederick S. Leinbach, Assistant Director of the Containers Branch of the War Production Board. Following is an important Chart of Packaging Materials Under Government Control.

This table lists, in alphabetical order, 113 basic raw materials used in packaging——from acetone to zinc—and gives WPB order numbers affecting each. Another outstanding chapter is "Wartime Package Conversions." It gives 17 case histories of repackaging into new types of containers.

The various types of tests and results achieved through them as used in all branches of packaging are catalogued, analyzed and discussed.

An important survey analyzes the new duties of paper in packaging foods, drugs, cosmetics and war materials. Directives for the uses of folding paper boxes, by the War Production Board, are listed. Another interesting article in the Carton and Box section is on "Substitutions in Fancy Packaging," a field of packaging which has been probably the hardest hit of all by priorities and shortages.

Exceedingly important to every packager—which means practically every manufacturer—is the chart on the properties of packaging materials. This chart lists tensile strengths, tear resistances, chemical qualities and many other essential properties of all materials used in packaging.

Price of the book is $2.50. Size of the book, 633 pages; cover size 9" x 12", leatherette bound.

★ ★ ★

STEEL CASTINGS FOR MRO EMERGENCY ORDERS

To provide a supply of steel castings to meet the demands of emergency orders for maintenance, repair and operating supplies, MRO Emergency Load Directives to producers of steel castings, reserving a percentage of their expected monthly production to fill such orders, have been established by the Steel Division.

Producers are to reserve the percentage set in each case to fill authorized controlled material orders bearing the allotment symbol "MRO," but such space in monthly schedules is to be reserved for this purpose only up to the lead time date specified for the steel castings in Schedule III of CMP Regulation No. 1. After that date the reserved space is to be used to fill any authorized controlled material order placed in accordance with CMP Regulations.

The directives establish the maximum percentages of monthly production of steel castings which may be reserved for MRO orders. If such orders are received after the reserved space has been filled they are to be treated as any other authorized controlled material order.

WeldELLS have everything ★

"For MY KIND of work, give me WeldELLS"

THIS maintenance job is a tough spot in anybody's language. But the piping end of it would be a bed of roses if all the lines were welded with WeldELLS!*

Give me a good man with a torch, and a stock of WeldELLS, and I'll show you how to lick those quick changes that come up these days, too. WeldELLS have everything it takes to speed up the job and cut the costs—tangents that make them easy to line up; quarter-markings to guide the work; clean bevels and lands that make welding both good and fast. You don't have to grope for the proper size either, because the size and weight is marked right there on the fitting.

When the job is done with WeldELLS it's done for keeps. There's no tinkering or trouble shooting. For my kind of work, give me WeldELLS!

★ No other fittings for pipe welding combine these features found in WeldELLS:

- **Seamless** — greater strength and uniformity.
- **Tangents** — keep weld away from zone of highest stress — simplify lining up.
- **Precision quarter-marked ends** — simplify layout and help insure accuracy.
- **Selective reinforcement** — provides uniform strength.
- **Permanent and complete identification marking** — saves time and eliminates errors in shop and field.
- **Wall thickness never less than specification minimum** — assures full strength and long life.
- **Machine tool beveled ends** — provide best welding surface and accurate bevel and land.
- **The most complete line of Welding Fittings and Forged Steel Flanges in the World** — insures complete service and undivided responsibility.

TAYLOR FORGE & PIPE WORKS, General Offices & Works: Chicago, P. O. Box 485

WeldELLS are just one of many Taylor Forge products that are vital to war and victory. An example is huge rolled steel rings—an important part of U.S. tanks now in action.

NEW YORK OFFICE: 50 CHURCH ST. • PHILADELPHIA OFFICE: BROAD ST. STATION BUILDING

* WeldELLS and many other Taylor Forge products are produced in Byers Genuine Wrought Iron.

Simplicity of Design Means Easier Maintenance

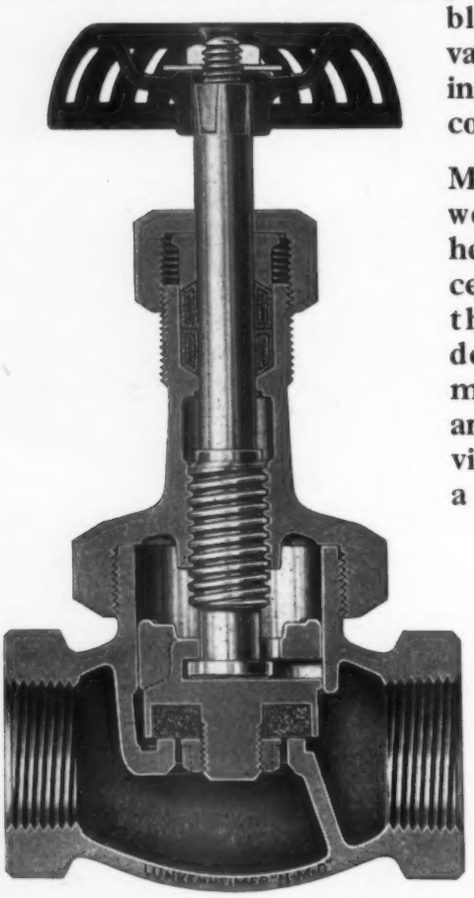
Plus Value

for the Maintenance Man

The scarcity of new valves these days places a premium on the lasting qualities and repairability of those you now have in service.

Valves with a minimum of parts . . . that are easily accessible for cleaning and repairs . . . that are made to such true tolerances that parts are interchangeable *in fact* . . . such valves give a plus value in time-saving and low-cost servicing.

Maintenance men who work with Lunkenheimer valves are receiving continual proof that simplicity of design means easier maintenance . . . they are getting better service longer and doing a better job faster.



"N-M-D" (NON-METALLIC DISC) GLOBE VALVE

The complete facilities of Lunkenheimer distributors are at your service. They'll help you get what you need and there's one near you to serve you. Ask for Catalog 78 or write us direct.

ESTABLISHED 1862
THE LUNKENHEIMER CO.
"QUALITY"
CINCINNATI, OHIO, U. S. A.
NEW YORK CHICAGO
BOSTON PHILADELPHIA
EXPORT DEPT. 318-322 HUDSON ST., NEW YORK

LUNKENHEIMER VALVES

HOW & WHY "SEARS" BUYS

(*Continued from page* 78)

to sell them supply or equipment items. Its purpose is to show them the lower prices resulting from bulk purchases and from following methods it recommends to reduce supply expense; viz.:

1. Control the use of supplies and the maintenance of equipment.
2. Determine actual necessity of an item before approving requisition.
3. Order through your Control Store Supply Department (i.e., through the nearest branch mail order house).

This catalog has five parts:

1. Miscellaneous equipment
2. Office equipment
3. Porters' supplies
4. Service Station equipment
5. Tailor Shop equipment.

Another feature of the promotional work is the issuance in ditto form of semi-weekly numbered bulletins by the General Purchasing Agent. These are on new contracts. They go to the branch house Purchasing Agents, and are presented under the following marginal headings: "Item, source, address, price, terms, f.o.b. point, remarks buyer."

Simple Records

To meet a situation caused by heavy turnover among supply clerks in retail stores Mr. Hodges introduced in 1936, and has used ever since then, a "Unit Supply Control Book." This is a looseleaf book on mimeographed sheets 8½ by 12¾ inches, so arranged that when open, the page at the left hand covers the fall season period purchase and inventory record and the right hand page the spring season. The directions call for the supply clerk to take an inventory of one-half of the items twice in each four weeks' period, and to place orders for items getting near the minimum quantity, determined by the number of days required to secure delivery on a reorder. They call for keeping supplies in bins, each with a tag showing minimum and maximum quantities. A feature of this system is a ready reference alphabetical index of supply items, with the following headings for each item: "Description, Form No., Buyer (indicated by a letter symbol), Page, Remarks—Bulletin or Manual."

The forms used from day to day in Sears' supply and equipment purchasing are simple. These, as shown

(*Continued on page* 208)

WORKING TOGETHER . . .

On land . . . on sea . . . and in the air . . . America is learning the lesson of working together. Cooperation of our armed forces is winning the war on the fighting front . . . while teamwork within industry wins our battle of production.

Cooperation with Stanley finishing engineers can make yours a better product because . . . Stanley chemists are experts in their field, just as you are in yours . . . war research has developed new finishes which you cannot afford to overlook . . . Stanley objectives are identical with yours (a better finish in less time and at lower cost) and two heads are better than one. Discovering the RIGHT finish for your product is a job that requires teamwork. Stanley engineers will pull their share . . . and perhaps a bit more. Your inquiry will incur no obligation. Address The Stanley Chemical Company . . . manufacturers of Stanley Lacquers, Enamels, Synthetics and Japans . . . East Berlin, Connecticut.

Stanley Chemical

Cut AIR EXPRESS COSTS by packing compactly

AIR EXPRESS shipments receive such careful handling that the need for heavy cases and bulky packing is often eliminated. Whether your shipment weighs a pound or a ton, follow these two simple rules to cut AIR EXPRESS costs and to save space vitally needed for war goods:

1. Pack compactly, but securely—to obtain best ratio of size to weight.
2. Break large shipments into smaller units whenever possible.

And for fastest delivery—ship early, as soon as package is ready—as early in the day as possible.

Air Express Speeds War Program

TODAY, AIR EXPRESS not only serves the home front but is also working hand in hand with the Army and Navy to supply our fighting fronts the world over.

TOMORROW, AIR EXPRESS will girdle the globe in international peacetime commerce . . . to bring *all* foreign markets to the doorstep of American business.

AIR EXPRESS
Gets there FIRST

Phone RAILWAY EXPRESS AGENCY, AIR EXPRESS DIVISION
Representing the AIRLINES of the United States

WRITE for our quick-reference handbook on "How to Ship by AIR EXPRESS During Wartime." Dept. PR-3, Railway Express Agency, 230 Park Ave., New York 17, N. Y.

HOW & WHY "SEARS" BUYS

(*Continued from page* 206)

in adjoining columns, are a retail store requisition, a purchase order, used by the "Control Supply Department"; that is, a branch mail order house, and a purchase order used by the supply department at 925 South Homan Avenue, the Chicago headquarters. The top copy of each of the purchase order forms, which are typed in quadruplicate, is a "scratch copy," filled out in pencil by the buyer, for guidance of the typist.

Looking Ahead

Getting away from forms and system, properly regarded as mere aids to buying and stock-keeping, and looking toward the postwar era, Mr. Hodges said: "What the future will bring as to supply purchases because of new methods and new materials brought out under the war pressure we cannot tell. Already we've had many changes. Paint used to be put up in tin cans; now it comes in paper containers with metal tops and bottoms. In housewares lines, before the war pots and pans were of aluminum and stainless steel; now they are of glass, and that has meant different interior protection through inverting covers and suspension in packaging. If in the postwar period they get the cost of aluminum down or develop plastics, as is widely predicted, there will be many changes. We might see 'Cold Spot' electric refrigerators made of plastics. Such changes would affect our packaging and would save the shipping element in the costs of distribution. Whatever comes, all of us in supply and equipment purchasing will have to be ready to make quick adjustments."

That from the General Purchasing Agent under the Vice President in Charge of Operations is in line with the recommendations made by Mr. Houser, the Vice President in Charge of Merchandising, in an address on "Post War Merchandise Planning" a few months ago before sales managers of New England. In it Mr. Houser built up to and set forth four explicit conclusions:

"No. 1.—No manufacturer has discharged his responsibility to the public until the lowered costs which machines give him are in turn given the public in the price of its finished goods, regardless of the successive manufacturing or distributing processes which follow.

"No. 2.—In addition to further manu-

(*Continued on page* 210)

HELP CONSERVE COPPER BY USING

Walworth No. 709—screwed end
Service Pressure Steam
¼" to 2" . . . 150 pounds
2½" to 3" . . . 125 pounds
Non Shock Service Pressure—
Cold oil, water or gas
¼" to 2" . . . 225 pounds
2½" to 3" . . . 175 pounds.
Walworth No. 709F—flanged end
Service Pressure Steam
1" to 3" . . . . 125 pounds
Non Shock Service Pressure—
Cold oil, water or gas
1" to 2" . . . 200 pounds
2½" to 3" . . . 175 pounds

Walworth
Iron Body Bronze Mounted Wedge Gate Valves
with Screwed ends or Flanged ends

Where ease of inspection or cleaning is essential, this saddle gate valve with its U-bolt body-to-bonnet connection fits the service. It is an ideal valve for lines carrying sludge, fluids of high viscosity, or mixtures which might have a tendency to clog under the disc or between the valve seats.

Walworth No. 709 Bronze Mounted Screw End Valve has wedge, seat rings, stuffing nut, gland bonnet bushing, and stem of bronze, but the rest of the valve is made of iron. Two drain holes inside the bonnet eliminate the danger of damage due to fluid freezing in the bonnet. The sturdy construction common to both screwed and flanged end types is clearly shown.

By using Walworth Iron Body Bronze Mounted Wedge Gate Valves at this time you will help to conserve copper – a critical war metal.

To help you "fit the valve to the service," you'll find pertinent information on Walworth's complete line of valves, fittings, pipe, and pipe wrenches in the New Walworth Catalog 42. Included are 78 pages of practical engineering data that simplify valve selection and make piping layouts easier. Write, on business stationery, for your free copy. Address: Walworth Company, 60 E. 42nd St., New York 17, N. Y., Department 82.

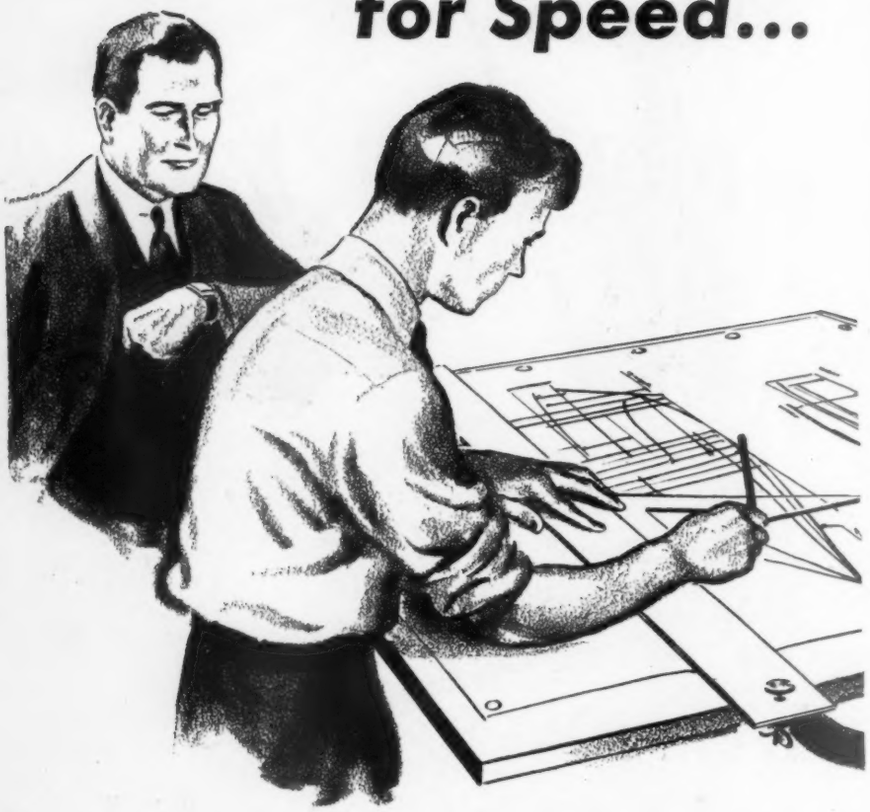
BOSTON WORKS
KEWANEE WORKS

WALWORTH
valves AND fittings

WALWORTH VALVES AND FITTINGS ESTABLISHED 1842

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

The greater the need for Speed...



...the greater the need for ARKWRIGHT TRACING CLOTHS!

If you're working under pressure, use Arkwright Tracing Cloths. Then you won't have to worry about erasures. You can erase easily and quickly because Arkwright Cloths have a smooth, almost smudge-proof surface. And you can ink over erasures neatly because both surface and base cloth are strong enough so they won't wear through. When time is important, choose tracing cloths carefully. Choose Arkwright! Arkwright Finishing Company, Providence, R. I.

Arkwright TRACING CLOTHS

AMERICA'S STANDARD FOR OVER 20 YEARS

HOW & WHY "SEARS" BUYS

(*Continued from page* 208)

facturing efficiencies, the wastes of traditional distribution must be minimized so that the people get the full benefits in lower prices which private enterprise promises them.

"No. 3.—When the manufacture of civilian goods is again resumed the firms which will survive will surely be those who have rid themselves of everything which might be termed non-essential—old equipment, complicated systems, inefficient plant layouts, old processes, excessive financial burden, or costly distribution methods.

"No. 4.—I would advocate the most thorough review of product, design, and method of manufacture, so as to be prepared the best possible way to offer the greatest possible values to the public."

In so far as it will not take time from their procurement for production to win the war, Purchasing Agents will do well to assist the managements of their respective companies along these lines. They are in good position to do so. They might well begin on No. 3.

The future will bring them new responsibilities, not only in procurement, but in an advisory capacity to management.

* * *

COMPANY ORGANIZATION FOR HANDLING PRIORITIES

(*Continued from page* 100)

ments also rely heavily on the priorities department. Relations with these departments, therefore, *must* be close. Information must come in quickly and accurately, and correspondingly, the outward flow of information must be smooth and reliable.

The details of handling the relationships between the priorities department, or the purchasing department if it handles priorities for the company, and the other departments of the business necessarily vary greatly with companies, depending on size, complexity of the problem for the company, geographical situation of the company, and the personal and organizational relationships between the Priorities Director or Purchasing Agent and other department heads.

In many cases liaison men have been used to aid in keeping interdepartmental relationships close. A

(*Continued on page* 212)

This VEEDER-ROOT COUNTING DEVICE *is like a* "WALKIE-TALKIE" *on all your production machines*

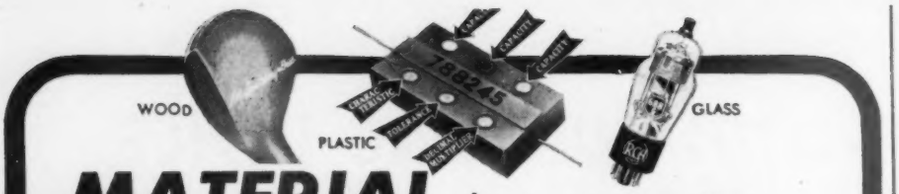
Veeder-Root Magnetic Counters flash reports on production progress in bold black-and-white figures . . . so that machines can be kept in step every minute of every shift. These counters are especially adaptable to electronic and "electric-eye" applications. In fact, they can report from any distance, from machines in the plant to a central control board in the office *miles away*.

And there are other Veeder-Root Devices, for mechanical as well as electrical applications, which are adaptable to any type of machine. These devices are compactly constructed, easily installed, no trouble to maintain . . . and can be obtained to count in any terms or units of performance . . . turns, revs, pieces, trips, flashes, or what have *you?*

VEEDER-ROOT

INCORPORATED

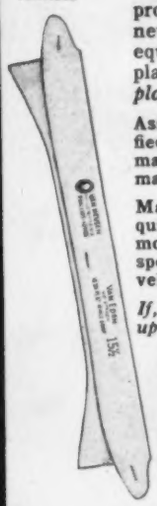
Hartford, Connecticut, U. S. A.



MATERIAL does not matter

—when it comes to **MARKING**

TEXTILES



METALS

Putting your name or trade mark on articles of post war production may, because of material changes, bring to you new problems. They are not problems to us because our equipment is now being used to mark, identify or number, plain or in multiple colors — war production items of *plastics, metals, fabrics, paper,* and many other materials.

Assembly is facilitated by small part marking, sources are identified by code or other marking, step processing keyed, and in many other ways Markem equipment, synchronized to automatic speed handling, is serving on the war production line.

Markem equipment is versatile and adaptable to frequent and quick changes. Material, surface or contour present no insurmountable difficulties. Markem equipment is engineered to special needs and Markem service includes the laboratory development of inks to meet every requirement.

If, for present or future use, you have a marking problem, put it up to MARKEM. Ask for Bulletin G 8

PAPER

MARKEM
MACHINE COMPANY
KEENE N. H.

BOXES

PRECISION BUILT PRODUCTION MACHINES FOR INDUSTRIAL MARKING

PLASTIC PATCH

Takes Traffic Immediately . . .

Here's a new, fast way to patch broken concrete without having to close off the area. Use durable INSTANT-USE . . . a tough, plastic material which you simply shovel into hole — tamp — and run traffic over immediately. NO WAITING. Bonds tight to old concrete. Makes smooth, solid, heavy-duty patch. Withstands extreme loads. Keep a drum on hand for emergencies. Immediate shipment.

Request Descriptive Folder . . . and Details of

FREE TRIAL OFFER

INSTANT-USE

FLEXROCK CO. 2319 Manning St., Phila., Pa.

Hodell

CHAINS

WELDLESS and WELDED

157 VARIETIES!

Hodell, in war as in peace, is a specialist in producing chain assemblies with or without attachments—assemblies that cover the widest range of sizes and uses. If your wartime production presents chain problems, let Hodell engineers help you. Send blueprints for estimate.

ESTABLISHED 1886

THE HODELL CHAIN CO.

CLEVELAND, OHIO

COMPANY ORGANIZATION FOR HANDLING PRIORITIES

(*Continued from page* 210)

man within the priorities department is assigned the definite responsibility of dealing with the sales department, for example, or the production or purchasing departments. Such an elaborate arrangement is not necessary unless the company is large and has numerous detailed matters which must be settled between the departments. If this is the case, however, it has the obvious advantage of enabling the sales manager, for example, to deal with one man rather than with an assortment of men, and thereby it expedites handling of questions which may arise. It would obviously be impossible for the head of the department to handle each detail personally; therefore, the assignment of a man to keep in contact with each of the other departments makes interdepartmental relationships much more satisfactory in many instances.

This type of organization of the department—specialization of jobs according to the department with which dealings are being carried on—may be contrasted to a purely functional type of organization, where, for example, one man may be placed in charge of securing all ratings for purchases, another for securing proper ratings from customers, and another for handling the extension of ratings to subcontractors. In this type of organization, it may be necessary for a man outside the department to either contact several men in the department or go directly to the head of the department in order to secure all the information he needs.

Keeping Lines Straight

It should be noted that the two types of organization are certainly not mutually exclusive. As a matter of fact, use of liaison or contact men is, probably in most cases and certainly often, joined with an office organization of the latter, functional type. It is, then, up to the liaison men to take the problems of departments outside the priorities department to the proper place within the priorities department and see that they are handled expeditiously.

In general, these liaison men should report to the head of the priorities department, or the Purchasing Agent if he has charge of priorities handling. They are his contacts with the other departments.

(*Continued on page* 214)

SAVE HOURS OF TRAINING
for your Screw Driving Army

PHILLIPS SCREWS ARE FOOL-PROOF!

Light-fingered and feminine . . . heavy-handed and he-man . . . raw recruit or veteran. All can be put on a high-production level on your assembly line by giving them Phillips Recessed Head Screws.

The scientifically designed Phillips Recess automatically centers the driving force and eliminates all driving troubles . . . fumbling, wobbly starts . . . slant-driven screws . . . burred and broken screw heads . . . and dangerous screw driver skids.

Screw and driver "become one unit", making such efficient use of turning power that driving is much easier and faster, regardless of driving method. And, power driving is made practical in most cases.

They cost less to use! Compare the cost of driving Phillips and slotted head screws. You'll find that the price of screws is a minor item in your total fastening expense . . . that it actually costs less to have the advantages of the Phillips Recess!

KEY TO FASTENING SPEED AND SAFETY

The Phillips Recessed Head was scientifically engineered to afford:

Fast Starting – Driver point automatically centers in the recess . . . fits snugly. Screw and driver "become one unit." Fumbling, wobbly starts are eliminated.

Faster Driving – Spiral and power driving are made practical. Driver won't slip out of recess to injure workers or spoil material. (Average time saving is 50%.)

Easier Driving – Turning power is fully utilized by automatic centering of driver in screw head. Workers maintain speed without tiring.

Better Fastenings – Screws are set-up uniformly tight, without burring or breaking heads. A stronger, neater job results.

PHILLIPS *Recessed Head* SCREWS

WOOD SCREWS • MACHINE SCREWS • SELF-TAPPING SCREWS • STOVE BOLTS

21 SOURCES

American Screw Co., Providence, R. I.
The Bristol Co., Waterbury, Conn.
Central Screw Co., Chicago, Ill.
Chandler Products Corp., Cleveland, Ohio
Continental Screw Co., New Bedford, Mass.
The Corbin Screw Corp., New Britain, Conn.
The H. M. Harper Co., Chicago, Ill.
International Screw Co., Detroit, Mich.
The Lamson & Sessions Co., Cleveland, Ohio
The National Screw & Mfg. Co., Cleveland, Ohio
New England Screw Co., Keene, N. H.
The Charles Parker Co., Meriden, Conn.
Parker-Kalon Corp., New York, N. Y.
Pawtucket Screw Co., Pawtucket, R. I.
Pheoll Manufacturing Co., Chicago, Ill.
Reading Screw Co., Norristown, Pa.
Russell Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Manufacturing Co., Waterville, Conn.
Shakeproof Inc., Chicago, Ill.
The Southington Hardware Mfg. Co., Southington, Conn.
Whitney Screw Corp., Nashua, N. H.

JOEY ON-THE-JOB SAYS...

"I give 'em a beating . . . and then wash 'em up and they're ready for MORE!"

JOMAC

REGULAR INDUSTRIAL GLOVES

They wear longer—taking the roughest handling and giving as much as *7 times the service* of ordinary work-gloves. A special knit in the Jomac Fabric makes this extraordinary wear possible. This hidden lock-stitch keeps the thick pile in place . . . and gives thousands of sturdy "cushions" which provide a semi-heat-resisting glove that protects the hands . . . allows a breathing-space to make possible the handling of reasonably hot metals. Endorsed by leading American shops and foundries.

And Jomac Gloves can be laundered, too. They are easy to wash, easy to keep clean . . . a safeguard against the dangers of dermatitis and other skin infections.

(Jomac also makes the famous Heat-Resisting Gloves.)

TEST THEM!

Just try JOMAC GLOVES on your stiffest jobs. Test them for wear, for washability, for economy, for *increased production*. Write for *full* details.

JOMAC

INDUSTRIAL GLOVES

C. WALKER JONES CO.

6135 N. Lambert Street, East Germantown, Philadelphia 38, Penna.

COMPANY ORGANIZATION FOR HANDLING PRIORITIES

(*Continued from page* 212)

Under his authority, it is much easier for them to get proper cooperation and action from members of the priorities department than would be the case if the liaison men were responsible each to the head of the department for which he handled contacts. If this latter situation were permitted, formal lines of authority would be badly crossed, and only great tact could prevent frequent clashes.

The degree of decentralization of the priorities handling job is varied with different company set-ups. Some find that leaving the handling of certain details in the jurisdiction of the department most immediately affected leads to speedier operation. For example, the sales department, in carrying on relations with customers, may have the job of securing all the necessary data from the customers, and making up the necessary forms from that information for forwarding to the Priorities Division, either direct or through the company's priorities-handling branch, or department.

Looking Ahead

It has already been indicated briefly that one of the chief duties of the priorities handling division, or rather of the head of that division, was to foresee changes in factors affecting the priorities situation and to arrange to meet them as well as possible. This has been touched again in regard to the present proposed W.P.B. decentralization and its possible effect on organization for contact with the government.

In regard to this subject, it should be noted finally and with some emphasis that this function is an all-important one, and one which must be assigned definitely and clearly to some member of the company's executive force. Of course, all the members of the top management are thinking about the situation with which the company is faced, and, in a general way, how it is likely to affect the company. But thought should be more delimited. It must be specific as well as general.

Therefore, companies must be certain that the organization which they set up to handle priorities does not consider itself merely a bookkeeping organization, whose sole duties are to make out forms and

(*Continued on page* 216)

Foiled!

"You can't beat that Alundum 36-I8 BE Wheel for this job"

The output of a grinding machine is tied up closely with the cutting action of the grinding wheel.

If your grinding machine production is low, a Norton engineer might simply recommend a change of the type of abrasive—or the grit size—or the grade—or the structure of the wheel.

Shoo away the Grindlins. Have a Norton engineer check the grinding wheel. He'll fit the tool (the wheel) to the job.

NORTON COMPANY • Worcester, Massachusetts

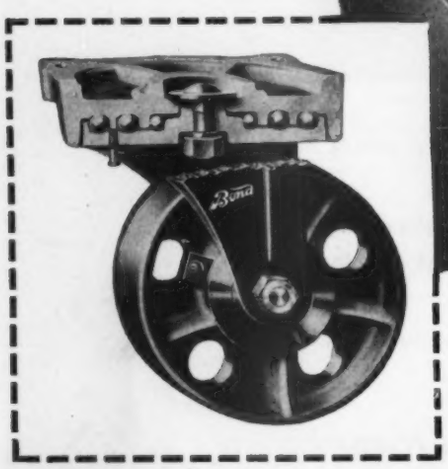
Behr-Manning, Troy, N. Y., is a Norton Division

NORTON ABRASIVES

Bond Casters Earn Their Wings
. . . in the Aviation Industries!

BOND Casters "keep 'em rolling" in the industries that "keep 'em flying." Aviation industries and ordnance plants use these easy swivelling, long lived casters on engine stands . . . on propeller stands . . . and for handling fuselages and complete bombers. Write for catalog K-34—and choose the casters that will move *your* materials swiftly and economically.

BOND 36-A CASTER (above)—Basically different in design, this caster combines easy swivelling with long service. The "reason why" lies in the arrangement of its ball races and its use of durable Bond Caster metal. Pressure lubricated throughout.



BOND 40-A CASTER (above)—The preferred light-weight caster for heavy duty. Sturdy, all steel construction reduces caster breakage . . . cracking . . . or excessive wear even under peak loads. Swivels with frictionless ease. Pressure lubricated throughout.

BOND 118-A CASTER (left)—Triple ball race caster for heavy duty and unusually hard service. Two large diameter, machine finished outer races carry the load; inner race absorbs all side shock. Cupped raceways assure even wear and long life. Pressure lubricated throughout.

BOND FOUNDRY & MACHINE COMPANY, MANHEIM, PA.

Bond* TRUCK CASTERS

* Reg. U. S. Pat. Off.

COMPANY ORGANIZATION FOR HANDLING PRIORITIES

(*Continued from page* 214)

furnish information. The head of the department, in addition to keeping himself continually well-informed about the government's actions, personnel, regulations, and attitude, must also realize that it is his job to foresee changes as soon as possible and adapt his organization to them. It is his job to make clear to others of the top management, for example, when complete conversion to war work appears in the cards for the industry, when a cessation of supplies for certain purposes is likely to come about, when the company is likely to be forced to contract or expand its operations because of the supply and war needs situation. It is his job, because he is the best-informed man in the organization on the activities going on in Washington, and today those activities are all-important.

Materials Are The Key

The war and the corollary industrial activity have not only complicated the jobs of industrial executives, but they have created a new job—one which may or may not be adaptable to proper handling by existing company officers. This job is to get information — information from customers, supplies, the government—to correlate it with information from the company's divisions and departments, and, on the basis of the facts thus secured, to secure the materials to keep the business going, and furnish the information that will enable top management to keep the company headed the right way.

Essentially, of course, the information has to do with materials—sales of them sometimes, manufacture of them sometimes, and purchasing of them almost always. For that reason, if a separate department is not set up, the job usually falls, and should fall, to the Purchasing Agent. If a separate department is set up, relations of that department and the purchasing department are necessarily very close.

The additional fact should be pointed out that competent handling of purchasing and priorities in war renders a service not alone to the company doing the purchasing, but to all of war production as well. Prompt and efficient handling of

(*Continued on page* 218)

GOVERNMENT "SPECS" for STAINLESS STEELS

NEW!

Revised Frasse Data Chart Now Available . . .

Incorporating all recent corrections and additions, this new Frasse Data Chart enables you to identify latest Government "specs" for stainless steels at a glance.

It shows the chemical analysis requirements for each Army, Navy, Aeronautical, and Federal specification, together with nearest commercial equivalents in A.I.S.I. standard type numbers. Especially valuable are brief descriptions of the various subclasses under each "spec" number.

The chart is handy file size, printed on tough stock, and suitable for wall or desk use. If you're working to Government stainless steel "specs", you'll find it invaluable. Just send in the coupon—a copy will be sent to you by return mail.

A REMINDER — in cooperation with W. P. B. The need for cutting tool conservation is urgent. If there is no comprehensive plan in your plant, start one today!

Frasse **Mechanical and Aircraft STEELS**

PETER A. FRASSE AND CO., INC. 1
17 Grand St., New York 13, N.Y.

Please send me a copy of your latest Frasse Data Chart, Section A, No. 2, showing Government "specs" for stainless steels and corresponding commercial designations.

NAME _____

FIRM _____

ADDRESS _____

SEAMLESS MECHANICAL AND AIRCRAFT TUBING • COLD FINISHED BARS • ALLOY STEELS • AIRCRAFT STEELS
STAINLESS STEELS AND TUBING • COLD ROLLED STRIP AND SHEETS • WELDED STEEL TUBING • DRILL ROD

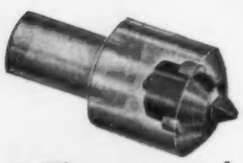
Whatever solution you may be using, you will find in our line of Dipping Baskets a metal suited to your requirements. And if none of our fourteen standard designs meets your approval, we will build to your specifications. Every basket is strongly braced and is adequate for the load to be handled.

The metal to be used in a particular Jelliff basket is determined by the cleaning and pickling cycle. It is obviously impossible to lay down any hard and fast rules, due to the wide variance in such influencing factors as construction of parts, character and strength of solution, methods of handling, temperature, possible galvanic action, etc. If you supply us with these essential facts, we will recommend the basket best suited to your needs.

The C. O. JELLIFF MFG. CORP.
22 PEQUOT AVENUE · SOUTHPORT, CONN.

DIAMONDS for Victory

BIG-HED-NIBS
LOC-KEY-SET
RE-SET-ABLE



Corner dressing
Closer tolerances
Micrometer Accuracy

Because: Wing key heat dissipation and absolute diamond lock nib.

● Three grades of diamonds. Common quality $12 per karat. Medium quality $24 per karat. Select quality $48 per karat. (Contour template diamonds supplied only in Medium and Select quality.)

All diamond sizes ¼ to 10 karat are nib mounted for immediate shipment . . . Billed subject to approval. Specify quality of diamond wanted. We recommend a minimum size of one karat for each 6″ diameter of grinding wheel. (24 hour resetting service, $1.00 post paid.)

Grinders instruction card free.

The Most Complete and Up-to-the-Minute Line of Diamond Tools for War Production. Send for Free Catalog.

DIAMOND TOOL COMPANY, Not Inc.
Sheldon M. Booth, Pres.
938 E. 41st Street CHICAGO, ILL.

a tire is thicker in the tread, a gun is thicker in the breech, this shovel is 60% thicker up the center than at the sides

Strengthens ALL Points of Wear and Strain*

RAZOR-BACK

Correct design gives 13 gauge strength with only 15 gauge average weight, permits deep hang, better working balance.

THE UNION FORK & HOE CO.
690 Hocking Street Columbus 15, Ohio

Also Stone, Ballast, Industrial Forks, Asphalt and Road Rakes — Your Inquiry Invited.

COMPANY ORGANIZATION FOR HANDLING PRIORITIES

(*Continued from page* 216)

priorities by buyers will enable faster action on them by the government, and manufacture of war materials will be speeded up.

The net result of all this has been to make the job of the Purchasing Agent even more difficult and important than it usually is. It is a challenge to him to apply his ability to a new problem, and an opportunity for him to put his shoulder to the wheel for his country as well as his company by doing his best on the job.

MORE ZIPPERS

WPB has ruled that distress carbon steel stocks may be used for a limited production of slide fasteners for civilian use.

STOCKROOMS UNDER GOVERNMENT REGULATIONS

(*Continued from page* 87)

When the stock on hand again drops to the ordering point as determined above then reorder the same amount of stock again and so on. In this way all items will operate with a maximum stock on hand of 60 days. Of course, if the demand changes sufficiently at any time it will be necessary to repeat the routine and recalculate the ordering point and ordering amount.

Recommended Procedure

Since it is very desirable to operate the stockroom most economically there is one other step worth following. In the publications already referred to a table is given for determining ordering amounts for which the operating charges are at a minimum. This table is given as Exhibit 3. To use it, it is only necessary to determine the quarterly rate in dollars at which the item is moving and the table gives the most economical ordering amount.

If this is less than the amount obtained by the above routine then it should be ordered for the sake of economy.

In the case of inventory control the same routine is followed but the amount ordered is twice the figure obtained after subtracting the number of days' stock required for safety stock from the number of

(*Continued on page* 220)

Sealed TO DEFY THE ELEMENTS

BLOW, cold winds of the Arctic! Pour, drenching rain of the tropics! Scorch, blazing sun of the desert!

Food, ammunition, spare parts, and supplies will still get through *undamaged* to our Allies and far-flung battle lines . . . thanks to efficient packaging.

NATIONAL'S WEATHERPROOF GLUES seal *out* the destructive forces of nature . . . seal *in* precious cargos of the "Arsenal of Democracy."

Trust your Victory Case and waterproof liner sealing work only to tried and true adhesives, *warranted* to meet Government specifications.

FREE BLUEPRINT

Charts adhesive recommendations for Overseas Packing under Govt. Specifications. Covers sealing of Victory Cases and Duplex Liners, labeling fiber and wooden boxes, etc. Request copies on your letterhead.

The Strongest

Bond of All

NATIONAL ADHESIVES

DIVISION OF

NATIONAL STARCH PRODUCTS INC.

820 GREENWICH STREET, NEW YORK

Chicago · Philadelphia · Boston · San Francisco · and All Principal Cities

HUSSEY
COPPER
TODAY'S FIGHTING METAL
A VITAL FACTOR IN BUILDING THE NEW WORLD OF TOMORROW!
Consult HUSSEY Engineers about your post war planning.
HUSSEY
C. G. HUSSEY & COMPANY
(Division of Copper Range Co.)
Rolling Mills and General Offices: PITTSBURGH, PA.
Warehouses in Principal Cities

STOCKROOMS UNDER GOVERNMENT REGULATIONS

(*Continued from page* 218)

days' stock specified by the regulation for the inventory.

The method outlined above is thought to be generally applicable to nearly all stockrooms; however, some special instances may occur where modifications in the method will have to be made.

For other regulations the method is the same but naturally calls for different ordering amounts. The routines and examples detailed in the accompanying procedure chart cover the various conditions which might be met under government regulations.

* * *

EFFICIENT LIGHTING EQUIPMENT

(*Continued from page* 81)

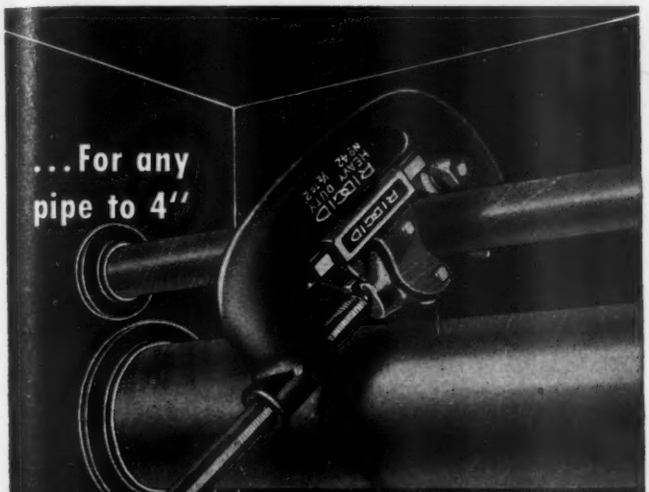
soap and warm water. Merely wiping off the reflector or glass with a dry cloth is not only insufficient but is also apt to shorten the life of the reflector. Greasy dirt and grime which remains after several dry wipings will tend to form a permanent coating which cannot be removed.

Replacement Schedule

Relamping—Rated life of a lamp is the average life of a large number of lamps and is not indicative of the life of any one lamp. Many lamps will have a much shorter life than the rated hours, but an equal number will burn longer than the rated hours. The lamps will, therefore, burn out at sporadic intervals with the maximum number of burnouts occuring at or near multiples of the rated life. Burned out lamps may either be replaced as burnouts occur or on a group replacement plan. The group replacement plan has the advantage that it may be combined with the cleaning program by arranging the cleaning schedule so that the lamps are approaching the end of life at some even multiple of the period between cleanings.

At that particular cleaning, which may be somewhere between 80% and 90% of normal lamp life, the entire installation is relamped and the system is restored to practically its initial efficiency. The old blackened lamps which are close to the end of life may be discarded, but

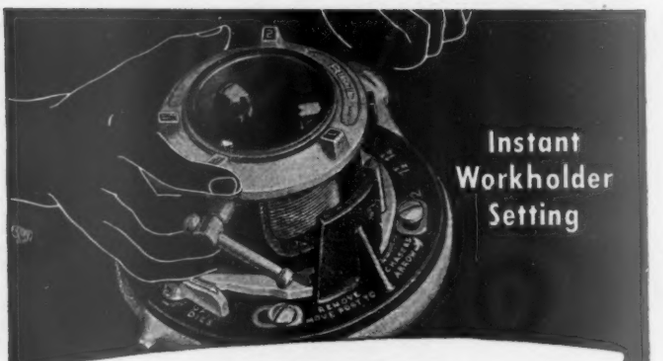
(*Continued on page* 224)



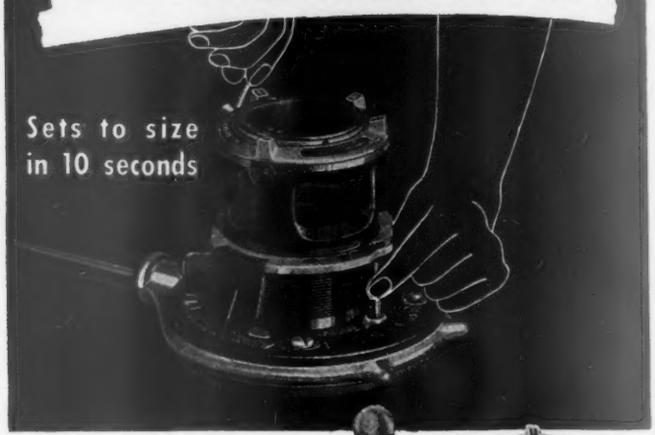
New Type RIDGID CUTTER with 4 cutting wheels

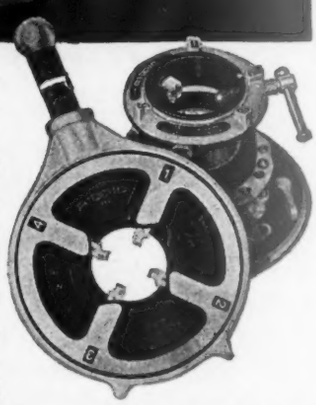
Cuts pipe if there's room for a quarter turn.

WHEN you have pipe to cut in close quarters, in a trench, near a wall or other pipes it's easier with this new RIDGID Heavy-Duty Cutter. The handle is short; and you use *four* heavy-duty cutting wheels *that roll right through pipe* up to 4" with a minimum of burr. The tough malleable frame holds perfect alignment, always cuts true. Comes in two sizes — No. 42, and No. 44. For tight-spot pipe cutting . . . ask your Supply House for the *new* RIDGIDs.



Nearest thing to an automatic 1" to 2" PIPE THREADER self-contained RIDGID No. 65R





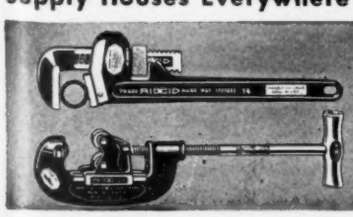
YOU set it to thread 1", 1¼", 1½" or 2" pipe by a simple 10 second adjustment. You set the mistake-proof workholder to pipe size by an instant turn of the gauge ring, tighten only one screw — no bushings needed. It's almost automatic. No extra chaser dies to carry around — one high-speed steel set stays in the die stock, cuts micrometer perfect threads on all four sizes of pipe with easy ratcheted strokes. Steel and malleable durability. For smooth speedy and easy threading . . . ask your Supply House for this self-contained RIDGID No. 65R.

Buy RIDGID Pipe Tools at Supply Houses Everywhere

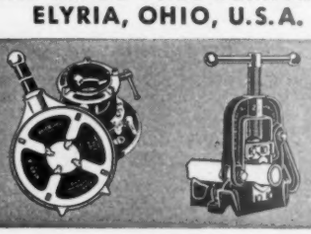
RIDGID

★ PIPE TOOLS ★

THE RIDGE TOOL COMPANY
ELYRIA, OHIO, U.S.A.



Fast-Working Tools for War . . . and the Busy Peace that's Coming



"THAT'S A BUILD-UP FOR A SMASH-UP"

NEW to the job, this young worker has stacked the chain so high on the hook that it can slip and crash the load.

Industrial inexperience and carelessness of all kinds cause two deaths, plus 200 non-fatal accidents, per hour. Last year there were 18,500 deaths and 1,750,000 non-fatal on-the-job accidents.

The calculated sabotage of enemy agents in America is small compared to the havoc wrought by loyal but inexpert workers. Managers and old-timers can help them by telling them about the National Safety Council's organized "don'ts" for crane and hoist operation shown below. Our Wright and Ford Divisions of American Chain & Cable Company, makers of hoists and chain blocks, are convinced that these rules, faithfully followed, will largely reduce hoisting accidents.

Hoists and chain blocks are but two of a long list of products we make for Industry, Transportation and Agriculture, which are essential in peace, vital in war.

National Safety Council Suggestions for Safety in Hoist and Crane Operations

1. Don't load chain too high on hook—or on the point.
2. Don't wrap load chain around load.
3. Keep hands away from load and sling while load is hoisted and lowered.
4. Don't stand between moving load and fixed object.
5. Keep out from under load.
6. Don't deposit load on inadequate support. Provide stops to retain stock which might roll.
7. Keep angle between sling legs as small as possible and see that hook will hold.
8. Make certain load can't tip or slide out of sling.

•

The American Chain & Cable Company is happy to cooperate with the National Safety Council in its nation-wide campaign to "Save Manpower for Warpower"—which is now being conducted at the request of President Roosevelt.

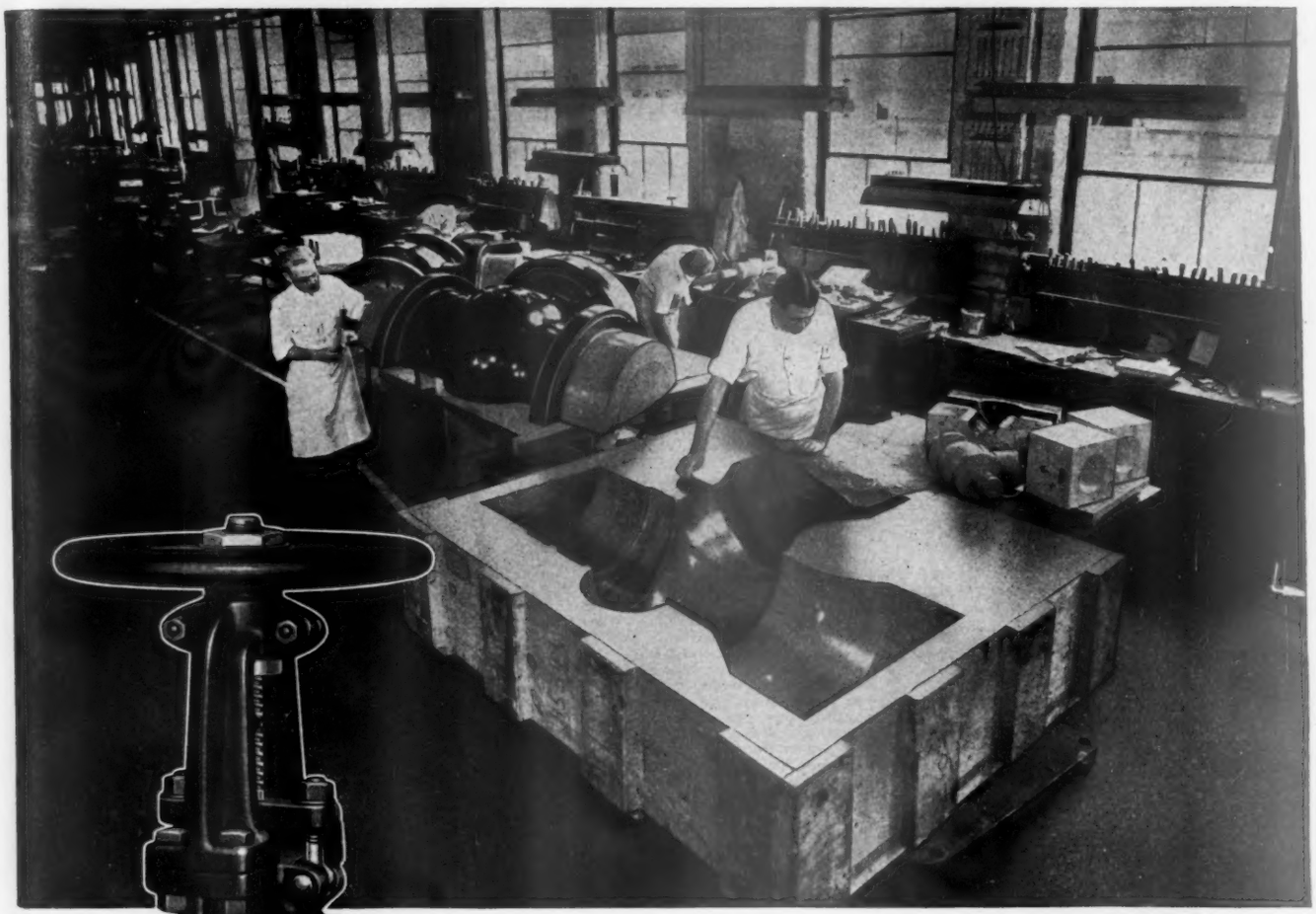
ACCO TRADE MARK

In Business for Your Safety

AMERICAN CHAIN & CABLE COMPANY, Inc.

BRIDGEPORT, CONNECTICUT In Canada—Dominion Chain Company, Ltd. • In England—The Parsons Chain Company, Ltd., and British Wire Products, Ltd.

Aircraft Controls, American Chain, American Cable Wire Rope, Campbell Cutting Machines, Ford Chain Blocks, Hazard Wire Rope, Manley Garage Equipment, Owen Springs, Page Fence and Welding Wire, Reading Castings, Reading-Pratt & Cody Valves, Wright Hoists and Cranes



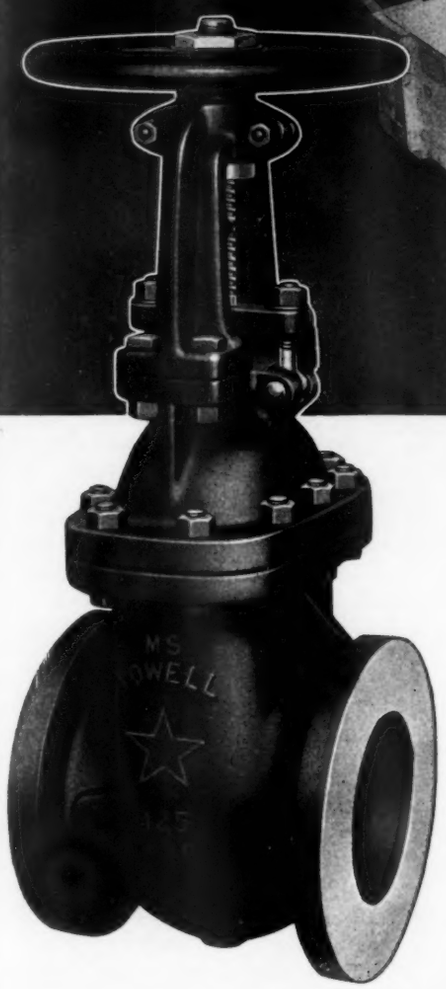


Fig. 1793—This large size 125 pound Iron Body Bronze Mounted Gate Valve has flanged ends, outside screw rising stem and taper wedge solid disc. Sizes, 2″ to 30″, inclusive. Also available with taper wedge double disc in sizes 2″ to 10″, inclusive (Fig. 1444).

Cradle of Industry— in the POWELL Line

Because the design of the Powell Valve Engineer is cradled into practical, serviceable reality by the skilled hands and practiced eye of the Powell Pattern Maker . . .

Because every POWELL Valve is nurtured from birth to installation by an almost century-old organization, whose business is making valves—and valves only—for Industry . . .

You buyers of valves are fully warranted in specifying POWELL Valves for all your flow control requirements, knowing that the POWELL name is your guaranty of pre-determined performance.

The Wm. Powell Co.

Dependable Valves Since 1846

Cincinnati, Ohio

POWELL VALVES

ARMSTRONG

There are no finer wrenches obtainable

Designed with a full knowledge of wrench requirement, each ARMSTRONG WRENCH is stronger for size and weight than an ordinary wrench, is accurately balanced and handier, will stand up under the hardest usage and gives years of service. They are drop forged from special analysis Carbon or Chrome-Vanadium Tool Steels and are heat treated to give the correct degrees of both stiffness and tensile strength. Openings are accurately milled or broached to exact clearances so they go over screw heads or nuts easily, yet take a safe positive grip that never slips nor rounds screw heads or nuts. That is why they are selected as the machine wrenches for the finest machine tools and airplane engines—why they are the standard wrenches in the best equipped plants.

Write for Catalog C-39a

Armstrong Bros. Tool Co.
"The Tool Holder People"
303 N. Francisco Ave., Chicago, U. S. A.
Eastern Warehouse & Sales Office: 199 Lafayette St., New York

FOR SALE OR EXCHANGE

2 Used McMyler Type J Gantry Cranes

Rather old but used very little.

One with 50-foot boom capacity at 20-foot radius of 25,900#. One with 70-foot boom capacity of 30-foot radius of 22,000#.

Rotating speed of cranes — 3 RPM
Hoisting speed on single part line — 150 FPM
Travel speed — 150 FPM

Cranes complete with Westinghouse Type K 56 H.P. D.C., 525 RPM, 550 volt motors and controllers.

PITTSBURGH METALLURGICAL COMPANY, INC.
Box 636, Niagara Falls, N. Y.

EFFICIENT LIGHTING EQUIPMENT

(*Continued from page 220*)

those showing signs of further useful life are set aside to replace the few early burnouts which will occur in the next group of lamps. Such a plan will materially reduce the labor cost of lamp replacement since there will be less wasted effort and setup time required when all the lamps are changed at once. Also, the additional labor required for relamping the luminaries as they are cleaned will be almost negligible.

Access to Equipment

Maintenance Methods — In low bay areas, lighting equipment can usually be maintained from step ladders, but higher bays present more of a problem. In some plants, the fixtures can be cleaned and relamped from a traveling crane, but it is frequently undesirable to tie the crane up for this work. Movable telescoping platform lifts are quite satisfactory in areas where the presence of machinery does not interfere with their use. One of the most convenient means of access to the luminaires is from catwalks, but the installation cost is high and they are feasible only on special applications where all of the fixtures may be mounted on a few catwalks. Automatic disconnecting hangers which permit the luminaires to be lowered to the floor by a chain or rope offer another convenient means of facilitating maintenance. A monorail system provides another quick and easy method of servicing the lighting equipment from traveling platforms or cars and is frequently used for large fluorescent installations.

Disconnecting type hangers or reflectors that are easily removable usually simplify the maintenance problem considerably, since the reflectors may be washed by one man on the floor or platform while a fellow worker removes the dirty reflectors from the luminaires and replaces them with clean ones.

Pertinent Comparisons

The importance of regular servicing of lighting equipment is strikingly illustrated by the results of tests conducted to determine the actual loss in illumination due to dirt collection on lamps and luminaires. In one case, a porcelain-enameled reflector for a fluorescent luminaire was removed from an average fac-

(*Continued on page 226*)

These WAR WEAPONS Are Too Valuable To Waste

THESE LYON PRODUCTS HELP MAKE THE MOST OF AVAILABLE MANPOWER

3-Shift Work Benches

Bench Legs

Material Handling Containers

Tool Stands

Adjustable Shelving (Patent Applied For)

Shoprobes (Patent No. 2-202-427)

The present manpower shortage has multiplied the importance of saving *hand* mileage and *foot* mileage for every available worker. That is one reason why so many war plants are making extensive use of:

1. LYON SHOP PRODUCTION EQUIPMENT: Work Benches — Material Handling Containers — Tool Stands and Cases, etc.

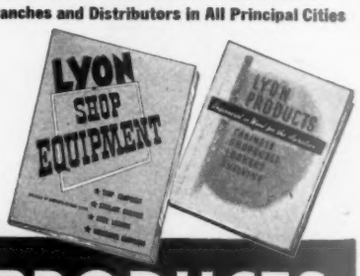
2. LYON STORAGE EQUIPMENT "ENGINEERED IN WOOD FOR THE DURATION": Adjustable Shelving — Portable Shoprobes—Lockers—Cabinets.

When Lyon equipment is on the job, unneccessary hand motions are eliminated, time-wasting trips for tools and materials are avoided . . . jobs move ahead faster. Equally important, accident hazards are reduced, fewer tools are lost or damaged, and workers' energy is conserved.

Write for Lyon Catalogs

LYON METAL PRODUCTS, INCORPORATED

General Offices:
3308 Madison Avenue, Aurora, Illinois
Branches and Distributors in All Principal Cities



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LOW-COST PROTECTION

Careyclad BLACK METAL COATING

If your normal supply of metal coatings has been restricted, CAREYCLAD may meet your requirements. CAREYCLAD does an effective job; it's economical; and the supply is plentiful.

CAREYCLAD protects metal against rust and weather — is extremely durable, abrasion resistant, and resistant to acid, alkaline and salt atmospheric conditions. It is a practical, low-cost coating for metal buildings, iron sheets, structural steel, bridges, heavy machinery, and numerous sheet metal products.

Applied by spray painting or brushing, at everyday indoor or outdoor temperatures. Promptly available in quantity through CAREY Branches and Distributors everywhere. Write for details, address Dept. 68.

.. INDUSTRIAL BUILDING PRODUCTS OF
ASPHALT —ASBESTOS— MAGNESIA

Roofing . . . Siding . . . Flooring . . . Insulations . . . Roof Coating and Cements . . . Waterproofing Materials . . . Expansion Joint . . . Asbestos Paper and Millboard

THE PHILIP CAREY MANUFACTURING COMPANY • Lockland, Cincinnati, Ohio
IN CANADA: THE PHILIP CAREY COMPANY, LTD. Office and Factory: LENNOXVILLE, P. Q.

EFFICIENT LIGHTING EQUIPMENT

(*Continued from page 224*)

tory area and tested for light output in a photometric laboratory. Light output was checked during various stages of cleaning and results were as follows:

(1) Dirty reflector and dirty lamps—22.8% decrease in light output
(2) Dirty reflector and clean lamps—18.1% decrease in light output
(3) Reflector wiped with dry cloth—6.2% decrease in light output
(4) Reflector and lamps washed —0% decrease in light output

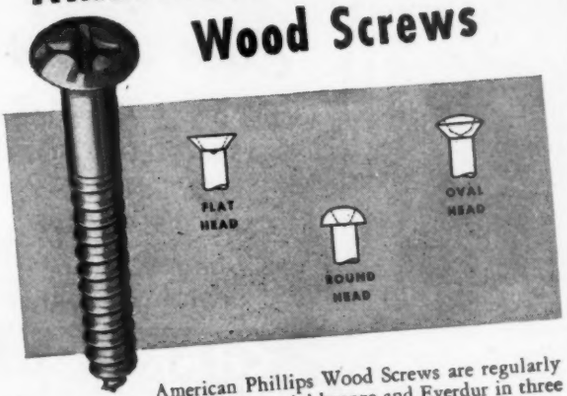
This reflector had not been serviced for approximately 6 months; if the period had been longer, the amount of light being wasted would have been even larger. Another laboratory test on two high bay reflectors yielded the following results:

A. Open High Bay Reflector from average factory area
   (1) As found—42% decrease in light ouput
   (2) Dry wiped—35% decrease in light output
   (3) Washed clean—0% decrease in light output
B. Enclosed Dust Tight High Bay Reflector from foundry
   (1) As found—7% decrease in light output
   (2) Dry wiped—5% decrease in light output
   (3) Washed clean—0% decrease in light output

The length of time since the last cleaning of both A and B above was over a year. The tests not only illustrate how much light may be wasted through neglect but also show two other interesting points. First, it is evident that dry wiping is entirely unsatisfactory for cleaning. The degree of ineffectiveness of dry wiping depends upon the character and oiliness of the dirt and the nature of the reflecting surface, but in no case is it adequate. Secondly, the comparison between A and B proves the economy of dust tight covers in extremely dirty locations, for B was in a much dirtier atmosphere than was A. In any case, whether the dirt be prevented from reaching the reflecting surfaces or whether these surfaces are kept at optimum efficiency by frequent washing, it is obvious that it pays to keep lighting equipment clean.

All Types of Screws . . . All Styles of Heads in the AMERICAN PHILLIPS Line

AMERICAN PHILLIPS Wood Screws



American Phillips Wood Screws are regularly made in steel, brass, commercial bronze and Everdur in three head styles, and in a complete range of sizes.

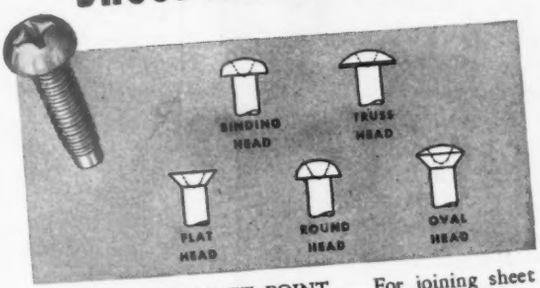
Because of the greater ease of driving, smaller pilot holes can be used, and where there is no fear of the wood splitting, all pilot holes can be entirely eliminated. This results in greater holding power per screw, allowing the use of fewer screws of the same size, or same number of smaller screws.

AMERICAN PHILLIPS Machine Screws

American Phillips Machine Screws are regularly made in steel and brass in the six head styles shown above, in a complete range of sizes, and in both the Coarse Thread (common) and Fine Thread (less common) series.

Driver point automatically centers in the recess . . . fits snugly. Screw and driver "become one unit." Fumbling, wobbly starts are eliminated. Driver won't slip out.

AMERICAN PHILLIPS HARDENED STEEL, SELF-TAPPING Sheet Metal Screws



TYPE "A" GIMLET POINT . . . For joining sheet metal up to No. 18 gauge (.050").

TYPE "Z" BLUNT POINT . . . For joining sheet metal up to No. 6 gauge (.203").

TYPE "C" TAPERED POINT . . . For die castings, plastics and other compositions. Type "C" Screws have a thread so designed that a standard machine screw of corresponding size can be turned into the thread formed in the metal. Can also be used in conjunction with standard nuts.

AMERICAN PHILLIPS Stove Bolts & Special Screws

American Phillips Stove Bolts are made in steel in three head styles, and a complete range of sizes. Threads are the American Standard Coarse Thread Series.

SPECIAL AMERICAN PHILLIPS SCREWS: With our complete engineering facilities, plus modern equipment, we can furnish screws to special specifications in such metals as nickel steel, monel, stainless steel, silicon bronze and aluminum alloy, in special shapes when ordered in manufacturing quantities.

MARK THAT ORDER

AMERICAN BRAND OF PHILLIPS Recessed Head SCREWS

AMERICAN SCREW CO., PROVIDENCE, R. I.

Chicago: 589 E. Illinois Street — Detroit: 5-267 General Motors Bldg.

ACROSS THE NATION

"THE OLD RELIABLE" IS ON THE JOB

On thousands of Victory jobs throughout the country—jobs demanding the maximum efficiency of every tool involved — you'll find that Lowell Reversible Ratchet Wrenches are preferred by experienced workmen because they are strong, fast and safe. We take pride in the knowledge that Lowell Wrenches are doing their part in providing America with the implements of war, and we are doing our utmost to make deliveries.

LOWELL WRENCH CO.
WORCESTER MASS.

LOWELL REVERSIBLE RATCHET WRENCHES
1869 1943

LEGAL DUTIES OF PURCHASING AGENTS

(*Continued from page* 90)

ploye performed within the course of the employment.

Therefore, it is quite apparent that the courts will not hesitate to "imply" obligations of trusts.

An outstanding example of this principle of law is found in the late case of Kinsback, 160 S.W. (2d) 509, reported March, 1942.

The facts of this case are that an employe was paid a salary by his employer. A person who had a special and patented tool to sell approached this employe and told him that he could earn $5,000 if he would agree to induce his employer to buy the patent. This employe believed that his employer could earn a nice profit from purchasing the patent at the price of $25,000, and at the same time decided that under the circumstances he would benefit himself, as well as his employer, by assisting in making the sale. Therefore, he at once began to present arguments to his employer in favor of purchasing the patent. Finally the employer purchased the patent at the agreed price of $25,000. Later the seller of the patent paid the employe a commission of $5,000 for his assistance in making the sale. When the employer discovered these facts he sued the employe and the higher court promptly held that the employe must pay to his employer the full amount of $5,000 that he had accepted from the seller of the patent.

This court explained that the employe was duty bound to represent his employer, exclusively, and that any and all profits earned by the employe in addition to the agreed salary belonged to the employer. Further, this court held that in a case of this kind the employe merely holds in trust for his employer such additional profits earned by the employe and without consent of his employer.

Exclusive Contract Cancelled

Another important point of the law relates to an agent's exclusive employment. In legal controversies of this nature the higher courts usually hold that an employe, as a Purchasing Agent, does not hold an exclusive contract, unless his agreement with the employer clearly indicates a valid contract to this effect.

The latest higher court case involving this law is Harvard, 45 N.E.

(*Continued on page* 230)

GRADE A
GRADE B
GRADE C
Parts Wrap
AXS-840
Revised May 4, 1943

Waterproof Case Liners
TYPE C—TYPE L-2
GUARANTEED TO MEET GOVERNMENT SPECIFICATIONS
Details on Request
Write or Wire
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PROMPT DELIVERY
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because they save hours of time, prevent costly breakage and long shut downs.

STEELGRIP Standard Rigid Arm Gear and Wheel Pullers are of improved design. Will not slip from work. Arms are forged and heat-treated. 2-arm, 3-arm and special models. 12 types and sizes.

CHAINGRIP Universal Pullers pull wheels, solid gears, pinions, etc., even at considerable distance from end of shaft. Proof-tested chains have both chain hooks and special pulley hooks. 3-ton and 12-ton capacities.

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CONTINUE TO "GUARD THOSE VALVES"

Since such tremendous tonnage must be carried to forces around the globe, it is easy to understand why Reading-Pratt & Cady for so long have advised you to "guard those valves." Ships are a maze of valves. ★ Strides toward victory should not encourage the thought that the transport of matériel for fighting Americans be put in jeopardy—so that we at home might have more. Now is the time to put into war every ounce of drive we can muster. Continue to guard your valves.

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D'ESTE VALVE AND ENGINEERING SPECIALTIES

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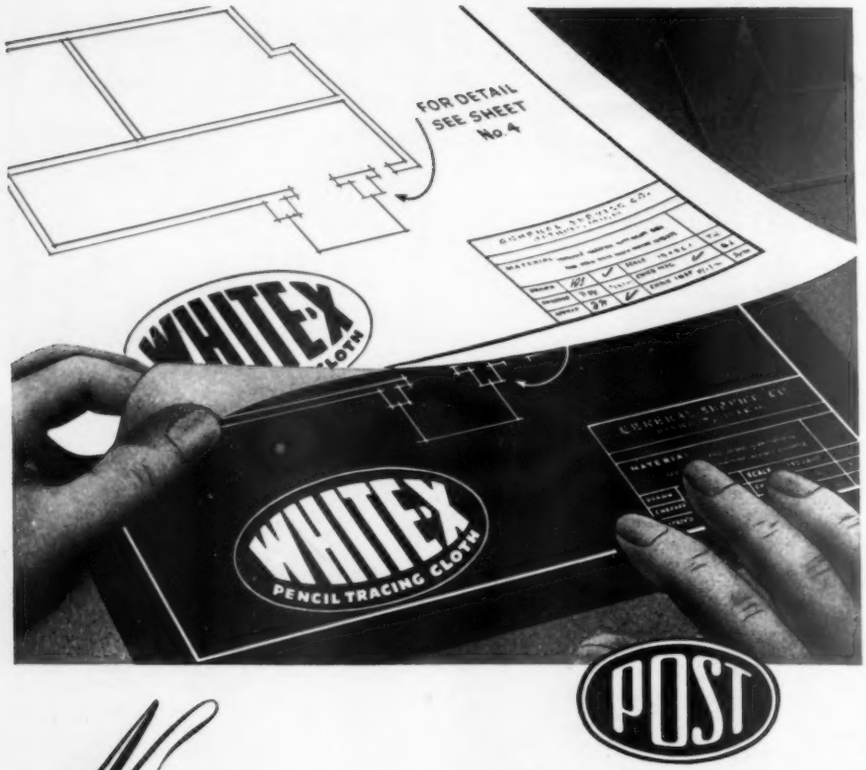

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The Frederick Post Co.
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LEGAL DUTIES OF PURCHASING AGENTS

(*Continued from page* 228)

(2d) 473, reported January, 1943. The facts of this case are that a representative of a manufacturer approached a purchaser and appointed him as an exclusive agent of the manufacturer's product in a designated territory. Later the president of the company wrote to this purchaser and stated that the franchise, or agency, was at "no time in danger, so long as you are willing to represent us loyally and effectively."

However, the contract failed to specify the date at which the agency terminated. In other words, the agency contract, on its face, was for an indefinite period of time and the purchaser believed that he had a right to continue as the exclusive agent of the manufacturer as long as he efficiently attended to the business and purchased a reasonable quantity of merchandise for resale in the designated territory.

In subsequent litigation the higher court held that the manufacturer had the legal right to cancel the contract at any time he decided to do so. This court explained that an agency is not permanent unless the agreement between the employer and the agent clearly specifies this fact. Further, an agency contract can be cancelled by either party if the contract does not clearly state the date the contract terminates.

This is important law and applicable to all contracts. In other words, a contract, irrespective of its nature, can be cancelled by either party at any time, if the contract failed to include a clause specifying the exact duration of the contract.

Authority of Salesmen

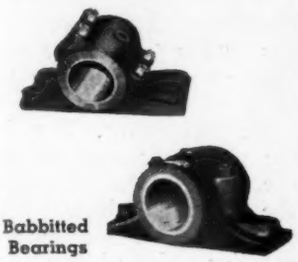
A common source of litigation arises through agreements made by salesmen or agents. The law is well established that a salesman has no more authority than given or authorized by his employer. And, furthermore, the courts have established the law that an ordinary salesman has no authority to bind his employer unless he is given special authority, or the purchaser has in the past been informed by the employer that contracts made by the salesman will be accepted as valid and binding.

This means that a contract made by a salesman is not, under ordinary

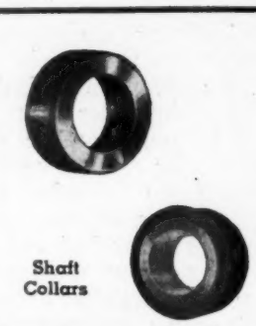
(*Continued on page* 232)

for MAINTENANCE PARTS SERVICE

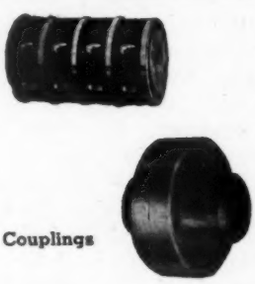
CHECK WITH LINK-BELT



Babbitted Bearings

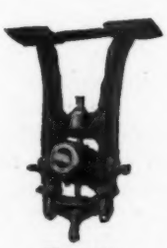


Shaft Collars

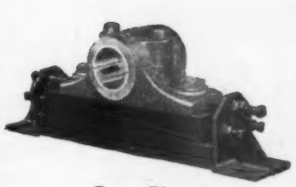


Couplings

Gears



Hangers



Base Plates

Take-Ups

Friction Clutches

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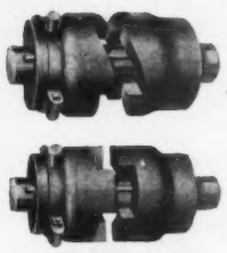

Jaw Clutches

Sprockets

Pulleys

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• The importance of every man doing his job has doubled as the United Nations constantly step up the tempo of war. And the importance of industry keeping its machinery in top production form is absolutely essential. Keep the wheels turning. Prevent overworked machines and equipment from breaking down. Frequent and thorough inspection of your equipment with detect potential failures, and prompt attention to extra care and maintenance will avert major repairs. Check your power transmitting equipment now and place orders for parts likely to require early replacements.

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on Bofors Gun production lines

METCO Metallizing Guns reclaim rejects —protect iron castings from corrosion

ONLY THE METCO Type 2E Metallizing Gun is equipped with the Power Control Governor. Built into the turbine, it automatically controls and stabilizes wire feed at *all* speeds . . . eliminates gear changes . . . avoids obsolete needle valve control which restricts air flow and reduces power at low speeds. For maximum efficiency and economy, insist on the Power Control Governor. Write for Bulletin 42A.

WHY USE strategic alloy castings or forgings *when metallized iron or carbon steel will do?* Why feed your scrap pile with costly rejects *when metallizing can salvage most of them?* With a METCO Metallizing Gun on your production line, you can avoid this two-fold waste of time and materials just as easily as Blaw-Knox does in building the famous Bofors anti-aircraft gun!

Huge quantities of bronze are conserved by casting 60"-dia. Gear Shrouds from iron instead . . . *Sprayed zinc coatings provide the necessary resistance to corrosion!* Hundreds of man and machine hours are saved by metallizing mismachined Base Rings weighing 1550 lbs. each . . . *Sprayed steel restores original dimensions—right in the boring mill where the error occurred!*

Any type of metal can be applied with the METCO Metallizing Gun to any base — without heat stress or distortion. Operators, male or female, can be trained within a few days. Write for details and your copy of METCO NEWS.

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METCO
REG. U. S. PAT. OFF.

WORLD'S FINEST METALLIZING EQUIPMENT

LEGAL DUTIES OF PURCHASING AGENTS

(*Continued from page 230*)

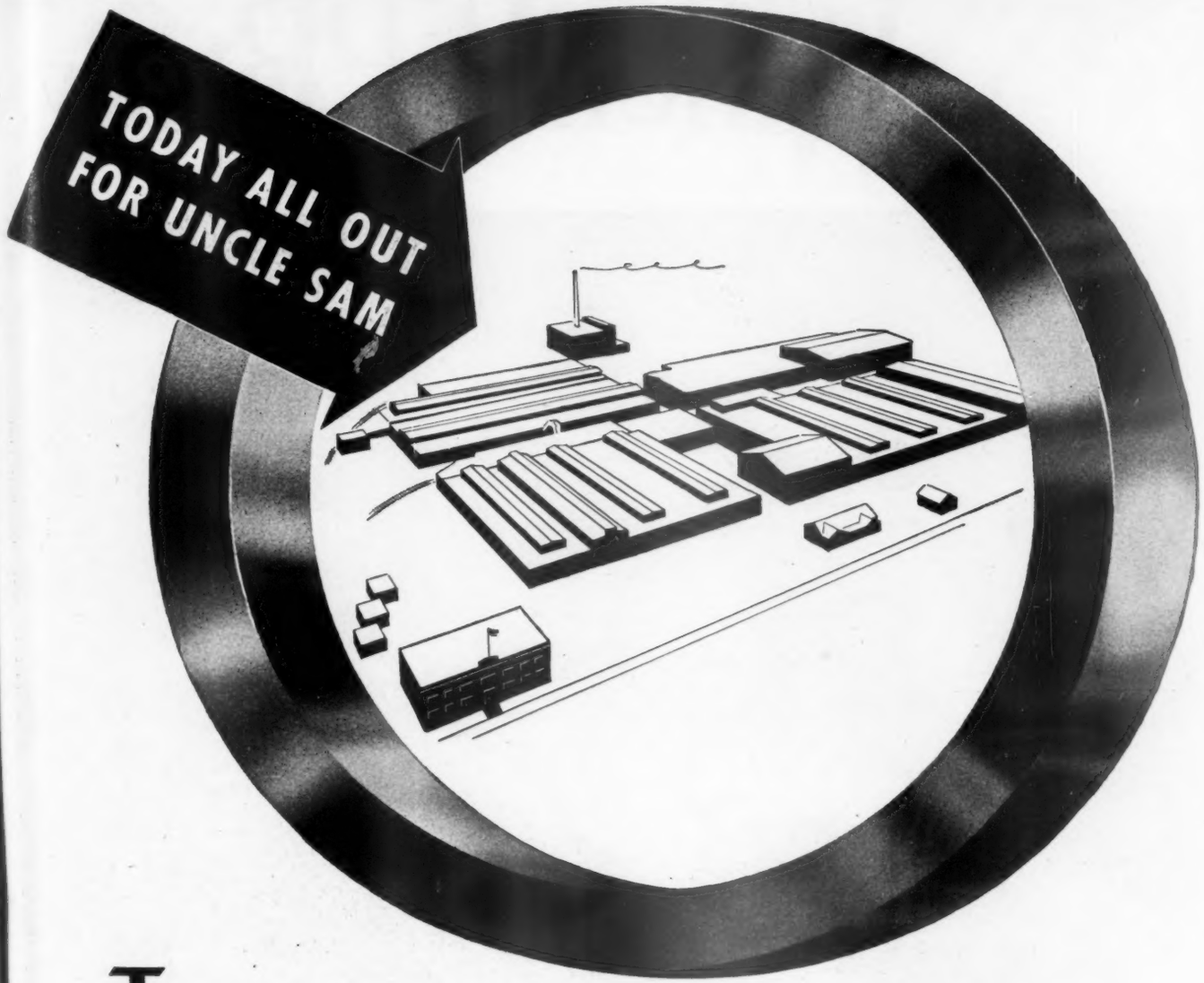
circumstances, binding unless the employer acknowledges and accepts such contract. Until the salesman accepts the contract, and agrees to be bound by the obligations therein, the salesman's promises merely are legal offers *on the part of the purchaser*. Either the purchaser or the salesman's employer may refuse to complete the agreement. For instance, the purchaser may, at any time before the salesman's employer accepts the offer, withdraw by so notifying the salesman's employer.

This peculiar point of law very frequently results in unusual litigation. In one leading case a salesman took an order from a purchaser. At 8 A.M. the purchaser mailed a letter notifying the seller that he had decided to not complete the contract. The seller did not receive this letter until the following day at 9 A.M. However, on the same day that the purchaser had mailed the letter, the seller at noon sent a telegram to the purchaser accepting the salesman's contract and stipulated when shipment would be made. In the subsequent litigation the seller contended that he had accepted the contract before the buyer had withdrawn his forwarded order or contract. However, the higher court held in favor of the purchaser because he had mailed the letter before receiving the telegram. The court explained that a letter is "legally" received by the addressee at the instant that it is deposited in the Post Office or regulation mail box, but that a telegram is not "legally" received until actually accepted by the addressee.

Read Before Signing

With respect to the usual authority of a salesman, see Griver, 128 Fed. R. 146, reported August, 1942. The facts of this case are that a salesman made a contract, verbally, with a purchaser. The salesman promised that when he got into the home office he would have his employer mail a written contract that contained all of the verbal agreements. When the written contract was received by the purchaser he signed and returned it without taking the time to carefully read the provisions. Later the purchaser discovered that the written contract in fact did not contain the verbal

(*Continued on page 236*)



Tomorrow circular, rolled and welded products for you—

Every facility of our plant (shown above) is now being utilized for Army work. That's today, but tomorrow—after the war—these same facilities will enable us to produce in large volume all manner of circular, rolled and welded steel parts. This includes rings, bands, and hoops of every description. To manufacture such products we have developed our own methods of fabricating on new improved machines, designed for large scale production. Right now is the time to talk about postwar manufacturing. If your plans call for items we can make, then let's get together for our mutual advantage.

the Cleveland
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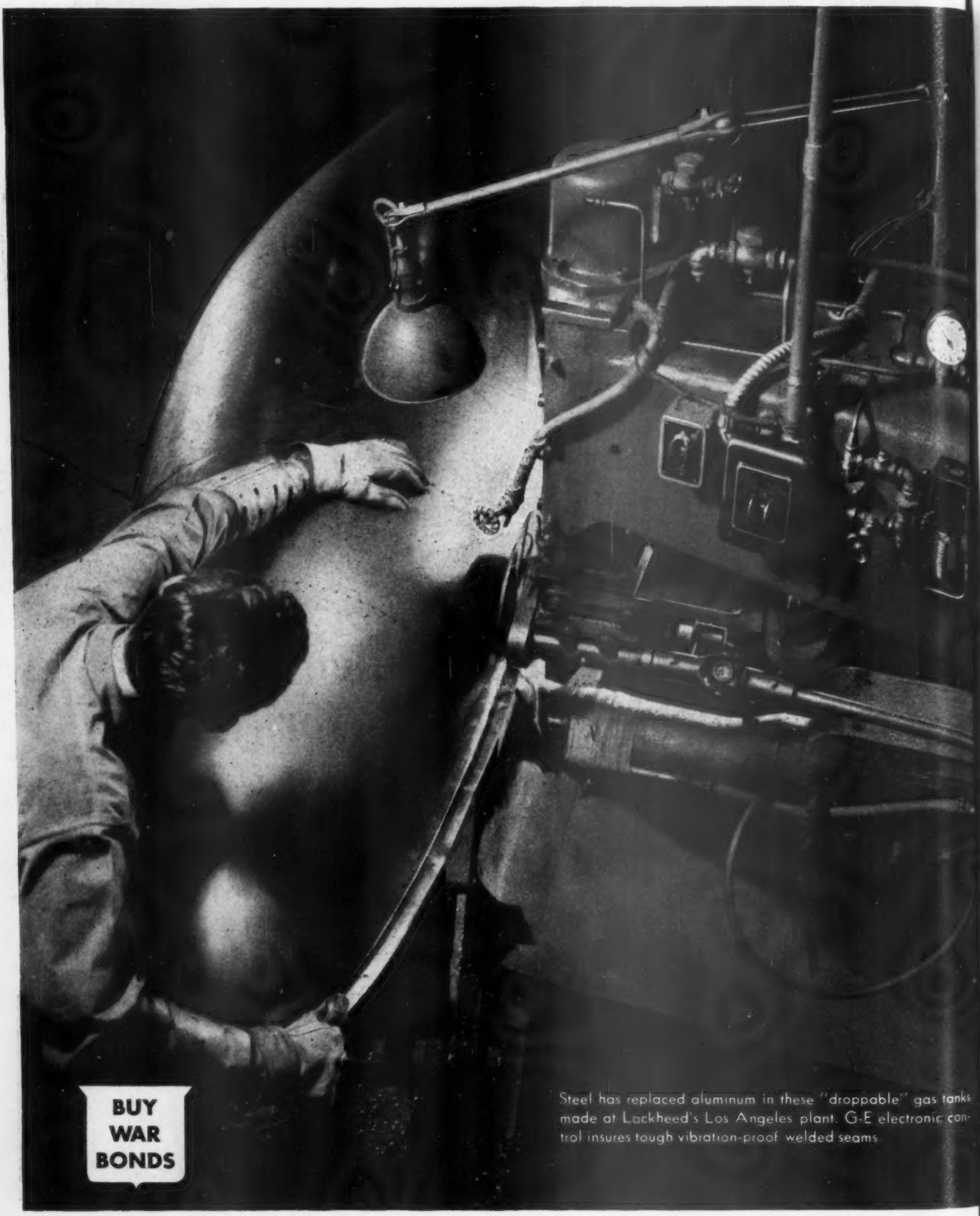
When WPB says

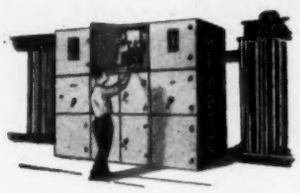


Steel has replaced aluminum in these "droppable" gas tanks made at Lockheed's Los Angeles plant. G-E electronic control insures tough vibration-proof welded seams.

BUY WAR BONDS

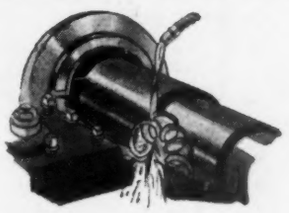
"STRETCH IT"

HERE'S THE KIND OF CONSERVATION HELP YOU CAN COUNT ON FROM G.E.



SAVINGS IN COPPER totalled 145 tons for a new war plant that installed G-E load-center power distribution. By using standard G-E switchgear and load-center unit substations, you get a better power system in less time—and save tons of copper which otherwise would be needed to distribute the low-voltage current.

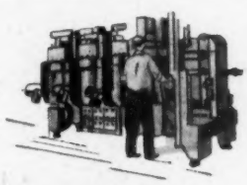
PLASTIC PARTS, made to new close tolerances, are saving tons of critical metals—for example, in a trench-mortar fuse which must pass 75 gaging operations. In developing new molding techniques to make this fuse, formerly made of aluminum, G-E engineers have provided another means of conserving scarce materials.



REFRIGERATION of food is undoubtedly a No. 1 conservation job. But G-E industrial refrigerating equipment is also to be found cooling finishing rolls to prevent waste of rubber; cooling welding tips to prolong their life; dehumidifying air to prevent rust and spoilage; cooling cutting oils to prolong tool life.

ELECTRONIC WATCHMEN in a chemical plant now catch impurities *before* they contaminate the final product, avoiding waste and boosting output. G-E electric eyes keep constant watch of material moving through pipe lines. When dark, undigested material appears, a warning sounds, permitting the operator to by-pass it.

RESISTANCE WELDING of gas-tight seams, using G-E electronic control, permits the use of steel for "droppable" airplane gasoline tanks—releasing aluminum urgently needed for other plane parts. The new welding method also saves the welding rod formerly used in torch welding, and results in an over-all cost reduction of 83 per cent.



POWER CONVERSION requirements of many war plants have been met electronically by the use of G-E mercury-arc rectifiers instead of rotating equipment. This has avoided making demands upon manufacturing facilities that are loaded with orders for motors and generators needed on ships, planes, tanks, and other combat equipment.

These are typical examples of how G-E products and engineering are helping industry to widen the war-usefulness of critical materials. If you are faced with new shortages, if WPB has said "Stretch it!" similar conservation measures may be *your* answer. In any event, it will pay you to discuss the possibilities with one of our engineers. Call on him through your local G-E office. ***General Electric Company, Schenectady, N. Y.***

GENERAL ELECTRIC

YOU ARE INVITED TO LISTEN TO "THE WORLD TODAY" 6:45 P.M. EWT, MONDAY THROUGH SATURDAY, ON CBS; AND TO THE "HOUR OF CHARM" 10 P.M. EWT, SUNDAYS, ON NBC.

"THE TAP-OF-THE-YEAR"

From a highly specialized plant in Greenfield, Massachusetts have been shipped hundreds of thousands of taps since Pearl Harbor. On each has been stamped the maker's name . . . "Threadwell". These high speed taps have gone onto hundreds of production lines that had never heard of "Threadwell" Taps before the war. And from these users of Threadwell Taps have come words of appreciation . . . for their stamina, accuracy and performance . . . for their rust-proof finish . . . for their "dot" system of easy identification . . . for the modern transparent plastic containers in which ground thread taps are shipped . . . and for the cooperation from Threadwell distributors in expediting orders and shipments. In the minds of many such users . . . Threadwell Tap is indeed the "Tap-of-the-Year".

EXPORT STOCKING DISTRIBUTORS

Threadwell

"TAPS OF DISTINCTION"

THREADWELL TAP AND DIE CO., GREENFIELD, MASS., U.S.A.

LEGAL DUTIES OF PURCHASING AGENTS

(*Continued from page 232*)

promises made by the salesman.

Litigation developed and the higher court held the purchaser bound by the written contract and explained that the verbal agreement made by the salesman was not valid because it had not been agreed to by the salesman's employer.

Employer's Responsibility

Notwithstanding the above explanation of law, it is well that the readers shall have further information regarding unusual circumstances under which a salesman's employer may be held responsible for contracts and promises made by the salesmen.

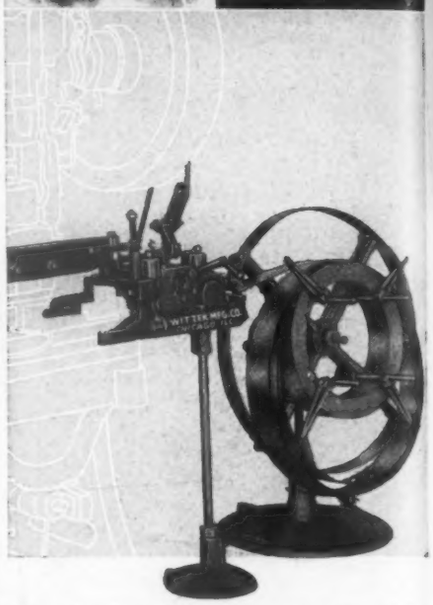
There are on record higher court cases which hold that if a salesman practices fraud, as making fraudulent promises or inducements, the employer is liable although the salesman has no authority to make valid and binding contracts. The term "fraud" in this respect is important. Generally speaking, a salesman practices fraud if he utilizes any deceitful methods by which a purchaser is induced into giving him a contract or order for merchandise.

Also, there are circumstances under which the employer or seller is responsible for the contracts made by a salesman, as follows: Where the employer in the past has accepted orders or contracts taken by the salesman and without notifying the purchaser that the contracts are acceptable. For example, if a seller adopts a rule to immediately ship merchandise, upon receiving contracts from his salesman, the law assumes that the seller has given the salesman unusual authority to make valid and binding contracts.

Also, some courts have held that a salesman automatically acquires authority to make valid contracts for his employer where the testimony proves that he displayed literature, advertising matter, or the like, to the prospective purchaser that indicated to the average and reasonably prudent purchaser that the salesman has unusual authority. Moreover, a letter received from the salesman's employer that expressly or impliedly informs the purchaser that the salesman has authority to represent such employer is positive proof that the pur-

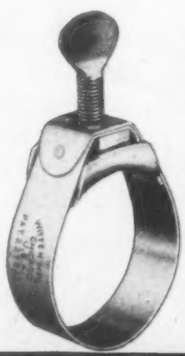
(*Continued on page 238*)

Our Punch Presses Are More Flexible And Productive With WITTEK *Automatic* Roll Feeds And Reel Stands



Manufacturers of metal stampings facing problems in the feeding of coiled strip stock to punch presses will find that Wittek Automatic Roll Feeds and Reel Stands conserve man-hours and achieve new high production levels.

Providing an improved and simplified method of punch press operation, Wittek Automatic Roll Feeds and Reel Stands insure rapid, safe and accurate feeding under all conditions. Made in four different types to meet all automatic feeding requirements. Write for complete details. Wittek Manufacturing Co., 4305-15 West 24th Place, Chicago, Ill.

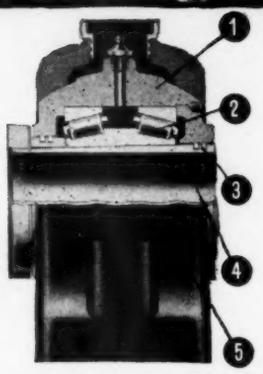


Wittek Hose Clamps for over twenty years identified with the Automotive and Aviation industries, are noted for their permanent leakproof hose connections. For original equipment and replacement.

ARMY NAVY

WITTEK MANUFACTURING CO. 4305-15 W. 24th Pl., Chicago

"FOUR FREEDOMS" THAT RELEASE *more power* for VICTORY



WHY DODGE-TIMKEN SPECIAL DUTY ADAPTER TYPE BEARINGS GET MORE POWER TO WORK:

1. Full ball and socket self alignment protects against wear and power-loss . . . also simplifies installation.
2. Dodge-Timken roller bearings provide full bearing capacity for radial and thrust loads . . . putting all the power in the job.
3. All metal automotive type piston ring seals keep grease in and dirt out, closing the bearing tightly against entry of foreign substance, but leaving it wide open to passage of power.
4. Long, split adapter sleeve distributes load over entire length of bearing . . . reduces pressure per square inch on shaft and eliminates peening action which causes rapid wear.
5. Rugged, well proportioned outer housing gives over-all protection to bearing.

These bearings are delivered completely assembled, ready for instant installation, capable of 30,000 hours' service under conditions for which they are designed; original lubrication lasts throughout 50 million revolutions. Available in a wide selection of types and sizes, suitable for all service conditions.

Typical installation of Dodge-Timken Special Duty Bearings and Dodge D-V Drive.

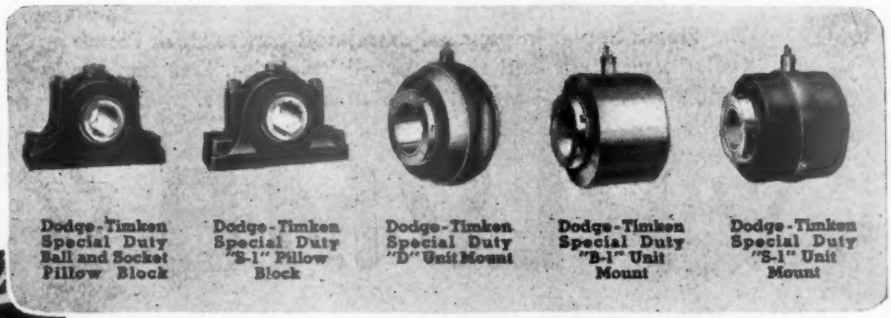
Freedom from *friction* . . . freedom from *power-loss* . . . freedom from *wear* . . . freedom from *maintenance!* . . . Dodge-Timken Bearing ings combine ruggedness, precision construction and smooth operating efficiency to bring those "four freedoms" to industry!

These rugged bearings keep power transmission channels free for full, unhampered flow of power to production machines. They prevent "clogging" of power-flow . . . they protect against slow-ups or "power blackouts" that are the ever-menacing maintenance threat of obsolete, worn out, friction-ridden bearings.

Now, and in post-war production, your plant can get more power *to work* with Dodge-Timken Bearings and other Dodge Power Transmission equipment.

Contact your local Dodge Distributor or write to

DODGE MANUFACTURING CORPORATION
Mishawaka, Indiana, U. S. A.



Dodge-Timken Special Duty Ball and Socket Pillow Block | Dodge-Timken Special Duty "S-1" Pillow Block | Dodge-Timken Special Duty "D" Unit Mount | Dodge-Timken Special Duty "B-1" Unit Mount | Dodge-Timken Special Duty "S-1" Unit Mount

DODGE
MISHAWAKA

THROW ALL YOUR SCRAP INTO THE FIGHT! BUY MORE WAR BONDS!

THE RIGHT DRIVE FOR EVERY JOB

PUT *ALL* YOUR POWER IN THE JOB

LET US MAKE ONE *for You*

Examine your war production job from the standpoint of special hand tools required to do it faster, better. Could a made-to-order tool increase your production—or make for more efficient handling of certain operations that occur over and over? If so, consult us about your problem. We have solved many-a-one for important concerns all over the country.

Fine Plomb quality throughout

In design, material, and workmanship your special tool will be of the same high quality that has made regular Plomb tools famous throughout all industry. The same engineers will supervise every detail. The same methods will be used in manufacture.

For regular tools see your PLOMB dealer

The Plomb dealer in your neighborhood carries stock Plomb tools in all kinds and sizes, for all industries. See him for regular tool needs—consult us about special ones.

PLOMB

PLOMB TOOLS CONTRACTING CO. *A Division of the*
PLOMB TOOL COMPANY
LOS ANGELES ▽ CALIFORNIA

LEGAL DUTIES OF PURCHASING AGENTS

(*Continued from page* 236)

chaser may, without liability, rely upon the fact that a valid contract is completed when the salesman accepts or agrees to an agreement respecting his employer's business.

Obviously, under the latter circumstances, neither the seller nor the purchaser may cancel the contract, as it is valid and binding on all parties immediately after the salesman and the purchaser complete their agreement, whether or not the seller accepts or approves the contents of the contract.

* * *

SETTING UP A NEW PLANT

(*Continued from page* 95)

which case we have to "be on our toes" if we are to get the right thing.

"But these are matters that all capable purchasing agents are familiar with. As a rule, the purchasing agent who is familiar with the requirements of his company, the equipment used, and the production procedure, and who knows how to intelligently collaborate with the plant men experiences little or no difficulty in making purchases.

"Quality should be the key-note in all purchasing. Take cutting oils: it is easy to buy low cost cutting oils. We believe in getting the best grade because good cutting oils assure longer tool life, and the quality of our production is correspondingly better. The same is true for all departments of our organization. Even in our office stationery we do not compromise with the factor of quality. For instance, we just bought 28# bond, 100% rag stock. To be sure, a 16# bond would fill the bill, but we believe a letterhead going to officials in the aircraft industry should be representative of the quality products and the high standing of our company."

Mr. Lotti estimates that 80% to 90% of the procurement responsibility lies entirely in the hands of the Purchasing Agent. In his company, all purchases regardless of

(*Continued on page* 240)

EGYPTIAN

Victory "Spec" Finishes

As the world map changes and the black areas happily grow smaller, radical changes occur in war equipment.

Not yet are we ready to beat our swords into ploughshares. But tanks are giving way to locomotives, old contracts for certain parts are not being renewed; we are approaching the saturation point on instruments, small arms and camp equipment. Contracts are being let for needed new and different materials.

As the battle fronts change, so change the production fronts—and the finishing fronts.

New and revised Finish Specifications for wartime equipment will shortly be issued. And as usual EGYPTIAN will be ready to meet them!

The newly revised 1943 edition of our book "United States Government Specification Finishes" will soon be ready for distribution to those interested in wartime finishes. Reserve your copy today. Please address Dept. P

THE EGYPTIAN LACQUER MANUFACTURING CO.
ROCKEFELLER CENTER—NEW YORK, 20, N. Y.

EGYPTIAN FINISHES

EGYPTIAN
Superior FINISHES

★

18 POINTS for QUICK and CAPABLE

Cooperation

on your

FASTENING PROBLEMS

from our Field Engineers

★ Trained to solve your fastening problems—to suggest correct methods and products meeting today's rigid specifications—the Central Screw Company representative in your territory is ready to help you determine the availability of your product requirements.

Bridgeport, Conn.
952 Main Street,
O. E. Pfannkuch

Chattanooga, Tenn.
702 Provident Bldg.,
Pierson-Deakins Co.

Dallas, Texas
1101-7 McKinney Ave.,
Air-O-Line Co.

Denver, Colorado
232 Dahlia Street,
Edw. C. Swan

Detroit, Michigan
2842 W. Grand Ave.,
Stanley A. Boltz

Kansas City, Mo.
1110 Woodland Ave.,
J. A. Clancey

Los Angeles, Calif.
1855 Industrial St.,
Rayburn-Judd Co.

Minneapolis, Minn.
100 N. 2nd Street,
Vincent Brass & Cop. Co.

New Orleans, La.
314 Balter Bldg.,
E. C. Beck

New York, N. Y.
4 W. 22nd Street,
R. C. Christie & Co.

Philadelphia, Pa.
265 Drexel Bldg.,
C. F. Kreger

Phoenix, Arizona
401 W. Jackson St.,
Dooley & Marinack

Portland, Oregon
1233 N. W. 12th Ave.,
National Steel Sales

Rochester, N. Y.
82 St. Paul Street,
A. W. Schmitz

St. Louis, Mo.
317 N. 11th Street,
J. R. Edwards

San Francisco, Calif.
355—9th Street,
Rayburn-Judd Co.

Seattle, Wash.
2726 First Ave. So., National Steel Sales

CENTRAL SCREW COMPANY

3515 Shields Ave., Chicago, Ill.

CENTRAL

You can depend on Central

SETTING UP A NEW PLANT

(*Continued from page 238*)

size must receive his approval as Director of Procurement. This applies even to a 15-cent booklet. "It applies emphatically to all production, maintenance and operating equipment," he said. "The minute you begin to make exceptions, you begin to pave the way for minor and major troubles."

He has not developed any unusual or special forms for use with procurement, preferring to utilize the standard forms common to purchasing procedure. In this connection, he feels that all catalog and printed matter should be in the 8½" x 11" size for easy filing and reference.

R. N. Webster of Greenwich, Conn., is President of Standard Aircraft Products, Inc. Heading the Electronics Division is Vice President Wells L. Riley, who is assisted by Mr. Lotti and Vice President and Controller Herbert J. Swann. A. Biber, in the New York office, is in charge of all purchases for the New York Company. The plant at Dayton is headed by Vice President and General Manager Robert Casey.

But the New York plant is exclusively Mr. Lotti's "baby", so to speak. Here he is the Vice President in charge of Procurement and Production.

* * *

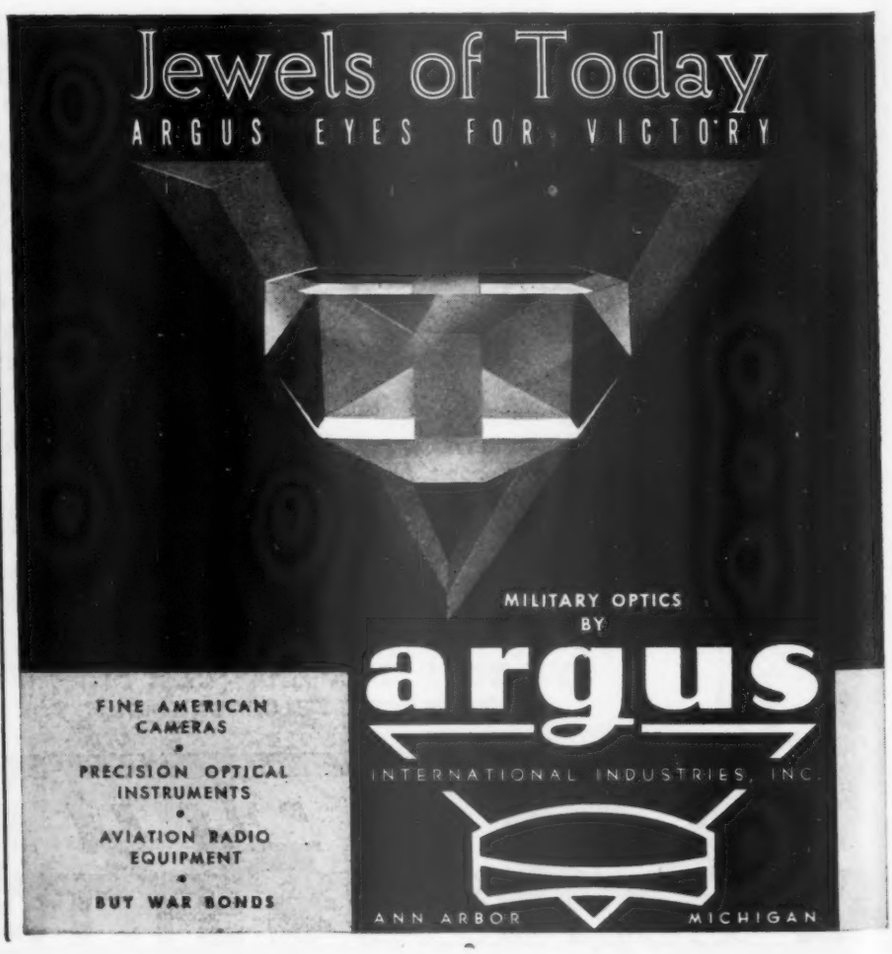
HOW TO PREPARE A BILL OF MATERIALS

(*Continued from page 83*)

materials required to make the product, except for the materials contained in GFE items.

CMP-2. The Detail Bill of Materials lists specified materials according to forms and units set forth in the general instructions. Additional information required, beyond that used for CMP-1, includes the identifying drawing or part number, part name, specification or chemical analysis of material, size, net and gross weight per part, number of parts actually incorporated in the procurement item, and total net and gross weight of material required. Net weights may

(*Continued on page 242*)



This FIGHTING FILE can free One Man in Five

BIG WORDS, these. But it's a fact proved by scientific tests: *Delta Files will do on the average 25% more work in the same amount of time, with the same effort.* Delta cuts clean. Bites deep. Eats away the hard part—hungry for tough metal. Each tiny steel fang snaps up its full share with every stroke.

Today the *right* file is important. You must get "full capacity." Manpower is precious. A worker's time is valuable. That's why it's essential that you select Delta Files—because *four men can do the work of five!*

DELTA FILES

DELTA

DELTA FILE WORKS
Philadelphia, Pa.

"I Offer You 'Manpower'"

To make a quick comparison with your present files, clamp a bar (say 1 inch square), upright in a vise and cut a hole in a sheet of paper to fit over the bar. Take 50 or 100 strokes with a Delta, each side, and collect the filings. Do the same with one of your present files. Weigh the filings. The difference is likely to surprise you. See the ease with which you file faster, better—and accomplish more work, in the same amount of time. Specify Delta—increase output, in spite of decreasing manpower.

YOUR DELTA FILE DISTRIBUTOR

HELP!

We Need War Work Sub-Contracts For Wood Work

If you're using wood products in your War work, we can help you—and you can help us. Centrally located in Cincinnati, we have one of the largest wood working plants in the country. *And we have ample supplies of lumber.* Our facilities for mass production of wood products are complete. We are equipped to do drying, machining, boring, assembling and finishing.

We want to keep our men and machines busy with large volume weekly or monthly repeating orders from firms with preference ratings. We would like to quote you. Our normal peacetime volume is one of the industry's largest, so our skilled manpower and our physical properties are adequate to handle any assignment.

Write, wire or 'phone for complete information.

NORWOOD
Manufacturing
COMPANY
Fabricators of Wood Products
NORWOOD
(Cincinnati 12) Ohio

HOW TO PREPARE A BILL OF MATERIALS

(*Continued from page* 240)

be omitted with the consent of the person requesting the bill of materials.

No estimate of lead time is required on CMP-2.

Lead Time

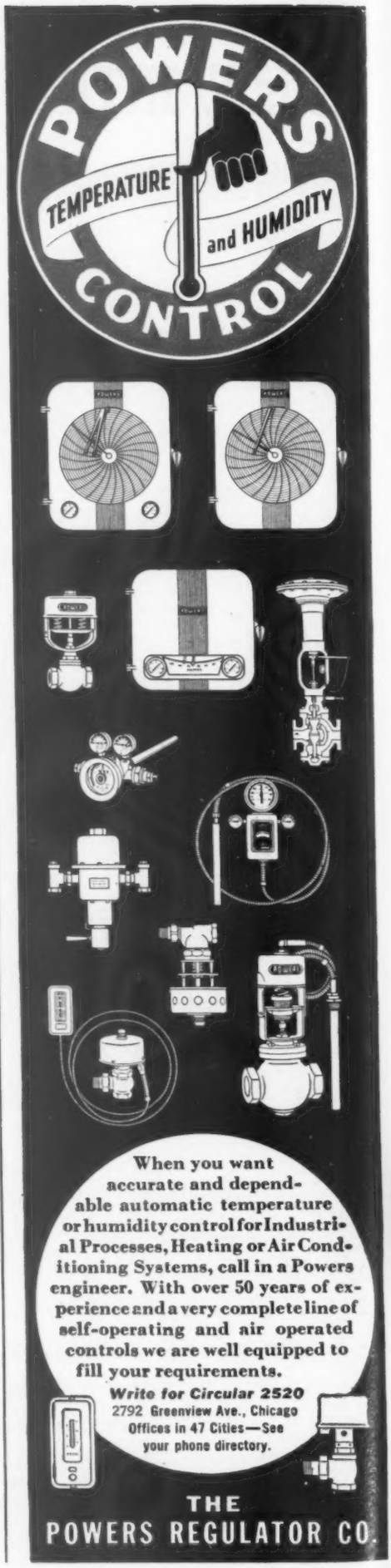
In the case of a material, lead time starts with the shipment of the material from the mill or other supplier, and ends with the completion of the product or acceptance of the procurement item. In the case of a Class B component or GFE item, lead time starts with the shipment of the product to the reporting consumer and ends as above. In preparing a Summary Bill of Materials for a Class B Product, whether an end product or a component, lead time ends with the completion of the B product.

In estimating lead time, it is assumed that the materials or products will be shipped on the date requested. Placement of orders sufficiently far in advance to enable mills and manufacturers to meet required shipping dates is a responsibility of the consumer, but does not affect lead time.

Lead times include average time allowance for initial and intermediate transportation, manufacturing operations, normal operating delays, minimum practical "in process" inventories, cycle time required while waiting for set-ups, and the accumulated times of all secondary consumers performing prior operations on the material involved.

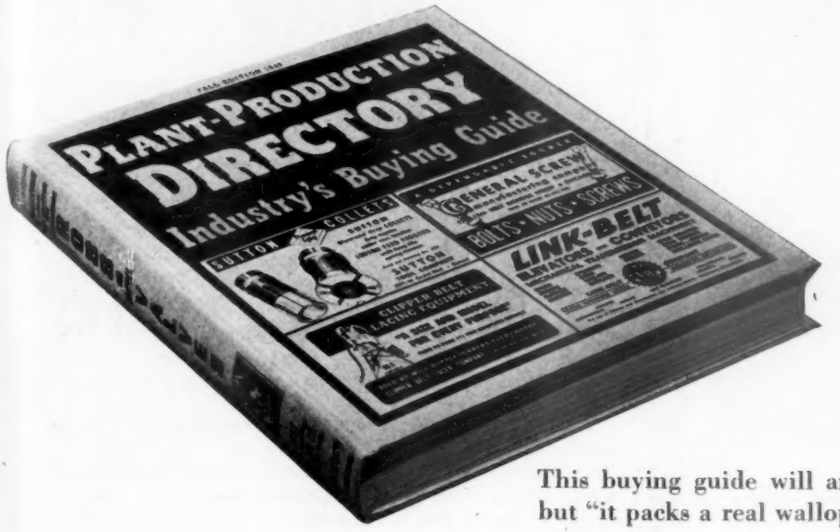
Lead times should indicate the amounts of each material or product required to be shipped in each month in advance of the completion of the product, the various amounts being shown separately, with the appropriate lead times indicated for each. In determining for each material the approximate weights which will be required various months in advance of the completion of the product, prime consumers should consult with secondary consumers wherever necessary, but it should not be necessary for the manufacturer to trace back the lead time on each individual part.

Calculation of lead times may be approximate, but must be realistic. Lead time is expressed in months, and except in very special circumstances should not be less than one month, as reported by a prime consumer.


POWERS
TEMPERATURE
and HUMIDITY
CONTROL
When you want accurate and dependable automatic temperature or humidity control for Industrial Processes, Heating or Air Conditioning Systems, call in a Powers engineer. With over 50 years of experience and a very complete line of self-operating and air operated controls we are well equipped to fill your requirements.
Write for Circular 2520
2792 Greenview Ave., Chicago
Offices in 47 Cities—See your phone directory.
THE
POWERS REGULATOR CO.

Use it for Two Weeks—

and Here's a Bet, You'll Never Use Anything Else



This buying guide will amaze you. It weighs only seven pounds, but "it packs a real wallop."

Whatever you need, you will find the name and address of the important suppliers listed in a simple easy-to-find arrangement.

Almost 50,000 copies of PLANT-PRODUCTION DIRECTORY are now serving industrial buyers, throughout the United States, yet every mail brings additional requests for this unique "source of supply" information directory.

Although buying guides are not new to industrial executives yet PLANT-PRODUCTION DIRECTORY because of its *modern streamlined* makeup has quickly "caught on" with the important buyers. It is so easy to handle, **so easy to use, and so easy to read** that it is preferred.

If you have not as yet made use of a copy of PLANT-PRODUCTION DIRECTORY try it out today. There is doubtless a copy somewhere in your offices.

Compare its time-saving features with anything else you may have used. It is our firm belief you will tell exactly the same story we are hearing everywhere—"it just can't be beat as a buying guide." PLANT-PRODUCTION DIRECTORY, 333 N. Michigan Ave., Chicago, Ill.

"Boy, do I like this one. Easy to use—easy for even me to carry to anyone."

New York Office
205 E. 42nd Street

Cleveland Office
Leader Building

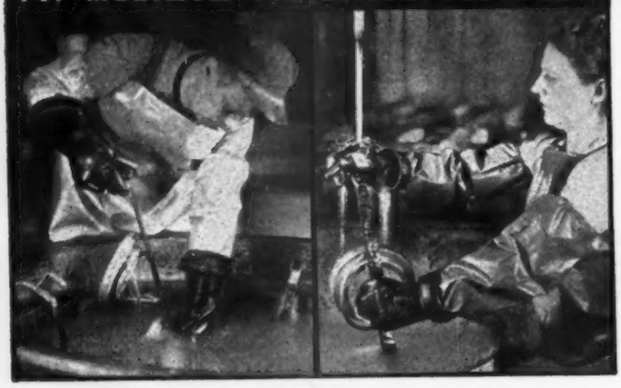
PLANT-PRODUCTION DIRECTORY

A CONOVER-MAST PUBLICATION

Surety

SURESEAL SYNTHETIC RUBBER GLOVES, APRONS AND SLEEVES . . . . .

For Maximum Protection and Wear



Victory over acids, chemicals, etc.

Learn all the facts right now about Sureseal Synthetic rubber gloves and protective garments. Surety developed—superior resistance to industrial acids, chemicals, oils, solvents, etc.—amazing wearing life over usual types—helps reduce huge toll of lost-time from dermatitis plaque, the infection responsible for over 70 per cent of industrial compensation claims. Send for complete informative literature and delivery data today.

Largest and Original Producers of Synthetic Gloves

THE *Surety* RUBBER COMPANY

CARROLLTON, OHIO

HOLLOW SCREWS

ALLEN Products stand up to the stresses in war-driven machines *and* die assemblies. They hold parts together *"under fire"*, — preserve the strength and unity of each assembly. . . The well-informed Purchasing Official needs a handy, charted reference to Allen SPECIFICATIONS. 10-page Bulletin *awaits your request:* — includes standard dimensions of Allen Hollow Set Screws, Square Head Set Screws, Socket Head Cap Screws, Flat Head Cap Screws, Socket Head (*"Tru-Ground"*) Shoulder Screws, "Tru-Ground" Dowel Pins, Hexagonal Keys, Hollow Pipe Plugs. Send for this Data-bulletin today.

ALLEN Products sold only through local Allen Distributors.

THE ALLEN MFG. COMPANY

HARTFORD, CONNECTICUT, U. S. A.

WELDON ROBERTS

Brightboy

REG. U.S. PAT. OFF.

FOR "ALL-IN-ONE"

FINISHING, DE-BURRING, POLISHING

- Bridges the gap between a grind and a buff.
- Does not load, gum or fill.
- Works metals wtih minimum dimensional loss.
- Requires no special preparation.
- Gives a precision finish that frequently serves as a final polish.
- Made in wheels, blocks, sticks, rods, for manual and machine operations.

Write us if your dealer cannot furnish you with Methods and Applications Data, samples and prices. Our field representatives are at your service.

BRIGHTBOY INDUSTRIAL DIVISION
WELDON ROBERTS RUBBER COMPANY
NEWARK, N. J.

THERE IS NO "CEILING" ON SEALING MATERIAL PROBLEMS AT FEL-PRO

Send for the FEL-PRO Material Sample Folder

Check your needs against the 36 samples of sealing materials shown, with full description, data and suggested applications. If you don't find in it, what you are seeking, consult Fel-Pro's Special Development Staff.

Put It Up to FEL-PRO for solutions to problems involving GASKETS, MOULDING, STRIPPING, MECHANICAL PACKING and other types of Sealing Materials.

Don't hesitate to send your problem concerning gaskets, mechanical packing, stripping, etc., to Fel-Pro.

We are accustomed to being "called in" on jobs that others have said were impossible—and finding or developing a Fel-Pro material that overcomes every difficulty. Sometimes the material to fit the special requirements is already in the Fel-Pro line, and has been used successfully for similar conditions, by other manufacturers.

Other times, there is no such material; then our engineers proceed to analyze, experiment and test, until they develop one that fits the need. Such was the case with Syntoflex, Lignoflex, Special Coated Stripping and other new Fel-Pro materials that are successfully replacing critical materials—and for certain purposes proving superior to the sealing materials they replaced.

Put it up to FEL-PRO

FELT PRODUCTS MFG. CO., 1574 CARROLL AVE., CHICAGO, ILL.

CHEMICAL SALVAGE

Chemicals Have More Varied Uses Than Steel in War Production

THE Salvage Division of the War Production Board has announced an extension of its chemical products reclamation program, designed to make sure that no valuable chemical resources, such as solvents and cleaners, cutting and lubricating oils, paints and chemical by-products, go down the sewer.

In order that they may help plants to improvise equipment for capturing and salvaging chemical products that would otherwise be wasted and lost to further war use, the Industrial Salvage Branch of the War Production Board has begun a study designed to locate important chemical reclamation opportunities. One thousand large users of chemical products, including manufacturers of munitions, aircraft, heavy machinery, engines, chemicals and plastics, have been asked to report briefly on their chemical products reclamation practices.

"Only when we know who is failing to reclaim chemical products essential to the war effort, is it possible for us to work out with these plants chemical salvage processes and procedures which fit their individual plant needs," explained Paul C. Cabot, Salvage Division Director. "Reclamation of apparently dirty and useless chemicals is a field of salvage activity that has been speeded and stimulated by war necessity. In peace time, we wasted chemicals, just as we wasted and neglected scrap metals. Today we cannot afford to waste chemicals, no matter how contaminated and useless they have apparently become during some cycle of the manufacturing process.

"Chemicals have more varied uses than steel in a war production program. A thousand chemicals and chemical processes go into the building of a battleship. Tanks, guns, planes and all other military equipment require 'war paint' protective coating to shield it from the elements—sun, rain, snow—to which it may be exposed.

"We need to stretch our chemical resources to the limit, and reclamation of solvents and cleaners, cutting oils and lubricating oils, protective coating paints and chemical by-products is one of the practical ways of doing it," Mr. Cabot declared.

Many plants have already developed practical chemical reclamation systems. Their experience will be passed on by the Chemical Resources Section, Industrial Salvage Branch, to other plants which are still wasting chemicals.

This section's study will determine where solvents and cleaners, cutting and lubricating oils used in excess of 5,000 gallons a year and government specification coatings (paint) used in excess of 2,000 gallons a year are now being reclaimed (that is, whether inside or outside the plant) and in what quantity. In cases where reclamation procedures are not adequate, technical services will be supplied to the reporting plants to enable them to institute such procedures on an improvised basis without expenditure of critical materials.

Among the chemicals which can be recovered or reclaimed in significant quantities, and their uses, are the following:

Carbon tetrachloride, trichlorethylene, and ethylene dichloride, used in dipping, vapor degreasing, pressure and other cleaning operations.

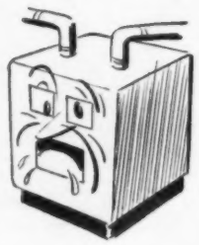
(*Continued on page* 246)

Official U. S. Army and Navy Photos
GARLOCK AT WAR...
97.93% of all products now being manufactured by Garlock go to war. More than half of that production enters into implements of war—and the remainder represents materials used in the maintenance of war plants. THE GARLOCK PACKING COMPANY, PALMYRA, NEW YORK.

FUEL OIL SHORTAGE?

SOLVE THE PROBLEM WITH

Electric Heat



Don't let possible shortages of fuels for heating threaten production. Electric heaters can help solve many heating headaches . . . quickly, easily, economically.

Westinghouse Large-Capacity All-Electric Fan-Type Dual-Purpose

UNIT HEATERS

For office, shop, crane cabs, control boards, operating stations, assembly lines, shop offices, receiving and shipping rooms, unloading platforms.

In winter, these heaters deliver a large volume of clean heated air—quickly, and economically. In summer, they can be operated as large-volume electric fans, with heating elements turned off.

HEATS IN WINTER COOLS IN SUMMER

MOUNTABLE ANYWHERE

WALL

CEILING

Large swivel permits heater to be pointed in any direction, regardless of how it is mounted. Other features include: Temperature limit switch to protect against overheating; drilled base for easy mounting; attractive finish; sealed-in Corox heating units; wide fan blades; heavy-duty Westinghouse fan motor.

Sizes available: 2, 3 kw for both 115 and 230 volts a-c; and 4, 5, and 7½ kw for 230 volts only.

For complete information, call your Westinghouse office or write for Catalog 28-000, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., Dept. 7-N. J-10249

Westinghouse

PLANTS IN 25 CITIES . . . OFFICES EVERYWHERE

(*Continued from page* 245)

Lubricating oils, cutting oils, hydraulic oils.

Naptha, thinners, solvents and alcohols used in the manufacture of paint, lacquers and varnishes.

Toluene, needed for TNT, pharmaceuticals, rubber solvents.

Benzol, needed for gasoline, synthetic rubber, plastics and dyes.

Ethyl alcohol, employed in explosives, solvents, rubber and anti-freeze mixtures.

Butyl alcohol, needed for plastics, photographic film, metal cleaners, rayon, lacquer solvents, and artificial leather.

There are many war essential chemicals which cannot be practically recovered for re-use in their original form. Nevertheless, effective conservation can be accomplished by proper salvage methods applied to what is normally considered scrap. Included in this category would be:

Paints and lacquers—Sludge from spray booths properly processed and re-used will extend the usage of such critical materials as glycerine, phthalic anhydride, phenol, which many times are present in the form of paint vehicle.

Plastics—The excess from a molding or extrusion operation in the form of flashing, trim, etc., can be reworked for many uses, thereby effectively utilizing to the maximum the raw materials employed in making the plastics, such as ammonia, calcium carbide, phenol, formaldehyde, and other critical chemicals.

S. Donald Perlman, Chief of the Chemical Resources Section of the W.P.B. Industrial Salvage Branch, is in charge of the study of chemical products reclamation in 1,000 plants.

* * *

MANY NEW PRODUCTS FORECAST

Cost of Metals to Go Down After the War—Industrial Miracles to Improve Peacetime Living

THE industrial miracle that is doing so much toward winning the war has made possible almost limitless opportunities to improve peacetime living conditions, electrical industry executives were told at a recent meeting.

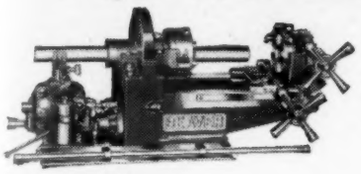
After peace comes, it is certain that there will be countless new products of improved design and better performance, according to B. W. Clark, vice-president in charge of sales for the Westinghouse Electric and Manufacturing Company. He spoke at the "all-industry" dinner meeting of the Electric League of Indianapolis.

Mr. Clark asserted that the experience gained in producing goods for war presents a long vista of improvement in design, manufacture, performance and cost of our present homes, automobiles, electric appliances, and other facilities that we have come to think of as having reached perfection in the last decade. Also, we can envision many new and useful developments that can make life simpler and easier, all brought about by the taming of the marvels produced by the ingenuity and invention for the prosecution of the war.

At the same time Mr. Clark cautioned that if we try to produce before we've taken the pulse of the market or tried on a considerable commercial scale the new methods available to us, there'll be many a cropper

(*Continued on page* 249)

The A-B-C of Pipe and Bolt Machines

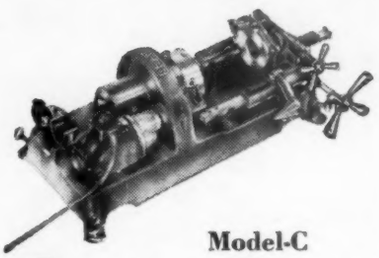


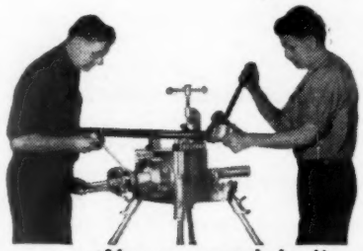
Model-A

A high-speed heavy-duty deluxe Pipe and Bolt Machine. Range ⅛ to 2-inch—up to 12-inch with geared tools and drive shaft. Bolts, ¼ to 2-inch. Wt. 415 lbs. Ask for Bulletin-A.

Model-B

A compact utility Pipe and Bolt Machine combining many features of Model-A with the easy portability of Model-C. Range ⅛ to 2-inch—up to 8-inch with drive shaft and geared tools. Bolts up to 1½-inch. Weight 280 lbs. Ask for Bulletin-B.





Model-C

A sturdy little Power Unit

Converts Hand Pipe Tools into Power Tools from ⅛ to 8-inches. Threads 8-inch in 6 minutes. Threads bolts up to 1½-inch. Equipped with automatic chuck wrench ejector—a safety feature. Two men can use it at the same time without interference. Easily portable—weighs about 150 lbs. Write for Bulletin-C.

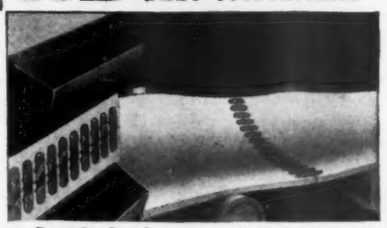
Also a complete line of hand tools.

BEAVER PIPE TOOLS

843 GROW AVE., WARREN, O.

Keep your conveyor belts going with FLEXCO HD BELT FASTENERS

• **FLEXCO H D RIP PLATES** are used in repairing rips and patching conveyor belts. The wide space between outer bolts gives the fastener a long grip on the edges of the rip, while the center bolt prevents the fasteners from bulging.



• Avoid shutdowns and lengthen the life of your conveyor belts and bucket elevator belts by using Flexco HD belt fasteners and rip plates. Thousands of companies have stepped up the performance of conveyor lines and cut costs by using Flexco methods.

• **FLEXCO H D BELT FASTENERS** make a strong, tight butt joint with long life. Recessed plates embed in belt, compress belt ends and prevent ply separation. Six sizes in steel and alloys.

Bulletin F-100 shows exactly how to make tight butt joints in conveyor belts with Flexco HD Belt Fasteners. Also illustrates step by step the latest practice in repairing rips and putting in patches.

Write for your copy

FLEXIBLE STEEL LACING COMPANY
4697 Lexington St., Chicago

FLEXCO HD BELT FASTENERS
Sold by supply houses everywhere

need the right shop equipment

"Hallowell" Work-Benches of Steel are available in 1367 ready-made, interchangeable combinations, and you can therefore get the *right* bench for every job at a fixed price.

HALLOWELL
WORK-BENCHES

Fig. 928. "Hallowell" Steel Work-Bench. Drawer is extra. Pat'd. & Pats. Pend.

"HALLOWELL" Wood Work-Bench
Duration Type

Fig. 1969
Drawer is extra

Length, height and width can be selected to specifications, and whatever extra equipment is needed can be readily added. Where wartime restrictions prohibit the use of steel shop equipment, "Hallowell" Work-Benches are now available in wood and orders can be filled quite promptly. Write for further information.

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Our plant, illustrated here, leads in the expert, production-line fabrication of canvas articles of every imaginable size and pattern. Our design and engineering departments can solve your problem, and we are experienced and equipped to make special applications of wood, metals, or plastic; of all types of closures and fasteners in connection with canvas or fabric items. Wire, phone or write if you have a canvas goods problem requiring experienced planning and volume production.

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SAFE SEALING is Vital to Victory

Production is no good, of course, until it reaches its destination safely. And that depends so much on good packing and safe sealing! Obviously, it's all-important to make sure that your shipments go out with maximum security. We know of no better protection than Orange Core Sealing Tape—"America's Most Popular Brand." Is your shipping room using it now?

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Send for this FREE Book

On pages 40 and 41 it tells you how to use a cold chisel. Pages 42 and 43 tell about hand filing. Page 45 tells about hack saw blades — and right through 48 illustrated pages it deals with the selection, care and use of metal working hand tools, including Porter Bolt Clippers. This book is designed to make tools do more work on the production front — a contribution to our war effort.

It is interesting to the experienced mechanic and invaluable to the new war worker. It is distributed free of charge — just ask for Porter Tool Maintenance Book on a postcard — or get a copy from your dealer.

H. K. PORTER, INC., 407 ASHLAND ST. EVERETT, MASS.

Reg. U. S. Pat. Off. HKP PORTER CUTTERS

BOLT CLIPPERS — AUTOBODY REPAIR TOOLS — PRUNERS

(*Continued from page 246*)

come. People do not readily accept radical changes in design. Neither can manufacturers, when they must suddenly shift to peacetime production, throw away all existing tools and manufacturing methods, and get started with entirely new products, producing entirely new results.

Recommending that post-war designing, thinking and discussion proceed on a sound, proven basis, Mr. Clark observed that some of the proposed designs for peacetime products were so futuristic that they seem to carry out the general idea of what the Sunday artists think is to be found on Mars.

The Westinghouse sales executive predicted that the pent-up demand for the goods of peace will be unprecedented and also that the means of purchasing will be there—in the form of War Savings Bonds, cash and credits.

Cost of Metals to Dip Sharply

The cost of metals will go down sharply after the war, thus making possible their use to an extent undreamed of in the past, Mr. Clark predicted. He made his forecast on the basis of the vast expansion in light metals and the results of wartime research in alloys. Steel research, the sales executive explained, is producing new alloys of unthought of strength and lightness and the plastics industry has received a tremendous impetus because they have been obtainable long after the metals they are replacing became critical. Wood products, cement and concrete, motor fuels, copper and brass are likewise showing amazing progress in usefulness and effectiveness.

He also expressed belief that the industrial readjustment to peacetime conditions could be accomplished with the speed with which American industry converted to war production.

* * *

SERVICING CARBIDE DIES FOR STEEL SHELL CASES

By Earl Glen
Carboloy Company, Inc.

WITH the conversion from brass to steel for shell cases ranging from 20 mm. up to 90 and 105 mm., the use of cemented carbide drawing dies has now become standard accepted practice. Carbide dies were of course being extensively used for drawing brass cases due to their longer life and lower cost per piece produced. However, with the advent of steel shell case, carbide dies became a necessity.

It is almost impossible to obtain reasonable steel case production without cemented carbide drawing dies. Conversely, therefore, the intensive and extensive development of carbide drawing dies has made possible the substitution of steel for brass, with attendant large scale conservation and critical materials, particularly copper. According to U. S. Army Ordnance, the saving on a single contract for 105 mm. shell totals 12,600 tons of critical brass, as an example.

The conversion from brass to steel did not present any unusual die manufacturing problems since the carbide dies used do not differ a great deal fundamentally from carbide dies used in drawing steel tubing. They have been used for such purposes for several years with great success.

Prime difference between most shell case drawing dies and steel tube draw dies is the provision of a guide

(*Continued on page 250*)

2¢ WOULD HAVE PREVENTED THIS SHUT DOWN

. . . . 2c MORE FOR A NON-RUSTING BOLT IN A VITAL PART

CAN A COUPLE OF PENNIES more per bolt save thousands of dollars? Indeed they can . . . and Harper Fastenings are proving it every day. Saving huge sums by preventing hidden destruction by rust and corrosion. They help war production machinery to stand up under today's grueling speed and overtime.

Such tremendous trifles, these Harper non-ferrous and stainless fastenings. Trifling too, in their extra cost. Yet tremendous in their usefulness.

4320 STOCK ITEMS . . . of bolts, nuts, screws, washers, rivets and accessories in the non-ferrous and stainless alloys.

WRITE FOR CATALOG . . . and reference book—80 pages—4 colors—193 illustrations—numerous tables and other data. Free when requested on a company letterhead.

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BRASS • BRONZE • COPPER • EVERDUR
MONEL • STAINLESS

with STANLEY STEEL STRAPPING

Reinforcement with Stanley Steel Strapping allows the use of light containers – saves extra weight – saves cargo space on today's crowded carriers. Light or heavy goods can be fully protected for long transit, rough handling. Packing and shipping operations are speeded up, and container cost and man-hours per unit are effectively reduced.

The Stanley Steel Strapping System includes tools and accessories for every type of shipping. Write for details.

PROMPT DELIVERIES to war production plants. 1843 STANLEY 1943

THE STANLEY WORKS

STEEL STRAPPING DIVISION • NEW BRITAIN, CONNECTICUT

(Continued from page 249)

ring plate on the former to guide the case into the die. When drawing steel tubing, the end of the tube is pointed so as to feed readily into the die without requiring a guide. In some instances of shell case drawing, moreover, rotary indexing tables are used, eliminating need for the guide ring.

As with any new application of a product, minor service difficulties are to be expected if the user is not acquainted with the characteristics of carbide dies and the proper scheduling and procedure for die maintenance. This is particularly important in view of the fact that quite a few organizations now switching to carbide dies for shell case drawing have had little or no experience with carbides in the past.

It is absolutely essential that large-scale users of carbide dies as for shell or case drawing be in a position to service and re-cut such dies. Carbide dies will produce several times the number of cases between servicing operations that are possible with dies of other materials. It is however necessary that they be serviced whenever a "wear-ring" appears in the die nib. In order to maintain continuous operation without an excessive stock of dies the necessary simple equipment for both polishing and re-cutting of dies should be provided at the point of use. It has been found also that when dies are not serviced by the user, there is a tendency to let them run longer on a job than they should for most satisfactory performance both as to die life and continuous production quality.

Proper attention to die maintenance will materially reduce the number of dies required for any given production set-up, an inportant point in connection with materials conservation, as well as in reducing the necessary die-inventory.

EXTENDS TOOL LIFE

Chromium Plating Method Rehabilitates Worn Tools and Dies

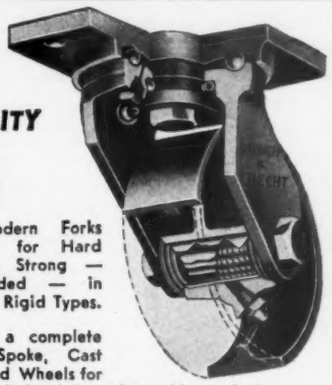
A METHOD of adding a paper-thin layer of chromium to worn tools and dies so they can "work thousands of hours of overtime" in the production of Army ordnance equipment was described recently by Edward J. Stone, manufacturing engineer at the East Springfield, Mass. plant of the Westinghouse Electric and Manufacturing Company. This plating method, so successful that tools and gauges have been reclaimed from the scrap pile and put back to useful work, has been a great salvation for over-worked machines and machine tools.

In these days when replacement parts are hard to obtain and delivery dates are so far off, salvaging tools by plating has assumed an important role in helping us to maintain production quotas. Mr. Stone said that chrome-plated tools outlast unplated tools by as much as 20 to 1. Some tools can be reequipped for many hours of production by the addition of only one to three ten-thousandths of an inch of chrome or one thirtieth the thickness of a human hair. The heaviest plate used principally on gauges, is five-thousandths to six-thousandths of an inch in thickness.

Chrome-plating cannot be applied to every tool, Mr. Stone warned. In order to produce a tool to give the required service, the plater should know what is going to be required of the tool, what material it is going to machine and what parts of the tool are going to do the

(Continued on page 252)

ROLL to VICTORY
on these TOP QUALITY
WHEELS and CASTERS



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CAST WHEELS, 4" TO 20" DIAM.

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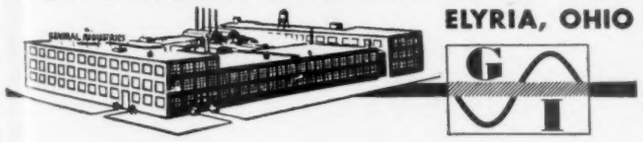
If you require small power motors for war production, — reliable, quiet and smooth-running, — you will find General Industries fully equipped to meet your specifications. For many years G. I. motors have been acknowledged leaders because of their simple compact design, quality materials and excellent workmanship. The G. I. line includes many standard types and sizes; and if any of these should not fit your needs, G. I. engineers are available to develop a type suited to your particular requirements where quantity production is involved. You can be assured of every cooperation.

THE GENERAL INDUSTRIES CO.
ELYRIA, OHIO

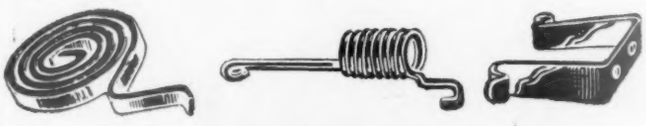


VICTORY is our Business!

Reliable

We at Reliable are devoting all our energies to the production of vital springs of every type for aerial combat equipment, ordnance, ammunition, and other machinery of war. We are proud of our capable organization, and particularly of our many women workers who have stepped into the places of men entering the armed services. Of such is the stuff of Victory on the home front made.

Yes, Victory is our business now—just as it is yours, whoever you are. The better, and the sooner, each Reliable spring fulfills its duty in our vast war program, so much nearer are we all to the day when peace again rules the world. When that time comes, Reliable *finer* springs stand ready to serve you as faithfully for the needs of peace as they have for those of war.



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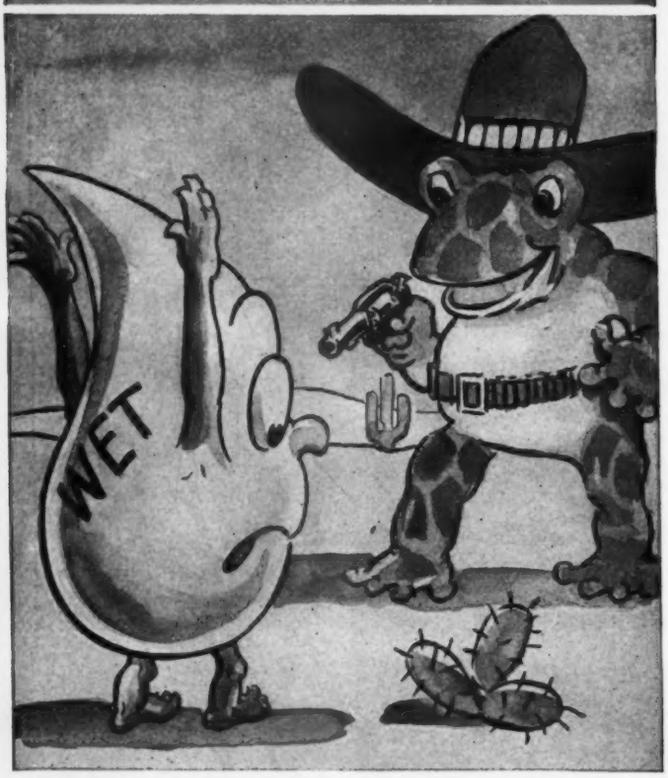
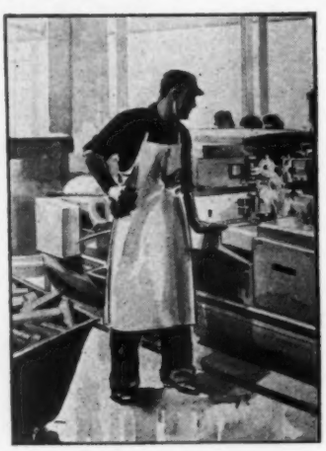
YOU CAN RELY ON
Reliable Springs
ROUND AND FLAT WIRE SPRINGS
CLIPS HOOKS BENDS LIGHT STAMPINGS

ALL SET FOR THE WET



FROG BRAND GETS THE DROP

That's Frog Brands job,...halting, controlling The Wet, through the full-cut, durable, protection of Frog Brand Oiled Work Clothing. Many men have put aside their industrial clothing for a bigger job, many will return once again to peaceful pursuits where protection from rain, moisture, — The Wet in all its forms is important. Today, this company serves both to the utmost of its ability, looks forward to the days of peace when all its production can be devoted to the fulfilment of civilian orders.



THE
H. M. SAWYER & SON CO.
EAST CAMBRIDGE
MASSACHUSETTS

Sawyer's

FROG BRAND OILED WORK CLOTHING

(*Continued from page* 250)

cutting and have to stand the chip friction. Plating is accomplished by immersing the worn tool or die, surrounded by a coil of wire, in a solution of chromic acid. A high electric current passing through the coil drives the chromium from the solution and onto the tool at the rate of one-thousandth of an inch per hour. Plating at a faster rate results in softer plate, the engineer said.

1 1 1

UNEXPECTED SCRAP HARVEST

Indiana Company Collects 41 Tons of Scrap They Did Not Know They Had

HERE'S a case history from Guy A. Wainwright, President of the Diamond Chain & Manufacturing Company, Indianapolis, Indiana, telling how his company collected forty-one tons of scrap steel that they did not know they had. It may give some ideas for your own scrap salvage operations:

"We have discovered forty-one tons of scrap steel where we believed it non-existent and while this figure is not impressive when compared with our daily production scrap sales, it does represent material that would otherwise have been completely out of circulation for an indefinite period.

"I cannot give you any universal remedies, but you may be interested in some of the details which may very well be applicable in other plants.

"I spent a considerable amount of time on the project myself and I feel well repaid—not only in the scrap results, but also in the amount of education I received for I learned a good deal about our plant that I did not know.

"I went with our Chief Inspector and our Factory Manager, C. P. Kottlowski, who thought of the very clever idea of carrying along a bucket of red paint and dabbing with it the articles that were to be scrapped so that the move-crew could later turn them over to the junk dealer without any additional instructions.

"We picked up the foreman in each department who accompanied us as we went through his department and answered numerous questions that no one else could answer. It is typical of a good foreman that he will not throw anything away. He knows from past experience that he might need it sometime, and in normal times he is perfectly correct in hanging on to anything that has even remotely any possible use. We adapted the general policy that nothing would be saved unless its future use was an assured fact and that any tool which had not been used for the past three years should be scrapped unless a specifically good case could be made for it.

"It is surprising how many rather bulky machine parts and tools had been lying around so long and had become so much a part of the scenery that no one accustomed to their presence could even see them. Everything that was not actually in use was critically examined.

"One source of scrap was old machinery which had been set aside to be used as a source of supply from which parts could be taken to repair breakdowns in similar machinery in use.

"As a result of the inspection, we definitely decided to abandon the manufacture of certain slow-moving models of chain and it is in this area in

(*Continued on page* 259)

LEE-BUILT SPRINGS

— always dependable

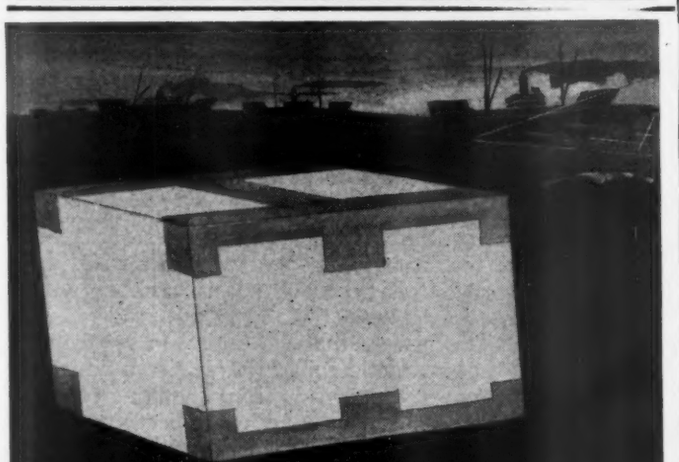
THE supplier needs a thousand eyes to foresee all customer demands— the buyer needs but one, to spot a supplier having those thousand eyes.

Ask About SCIENTECH Spring Service

LEE-BUILT TRADE MARK HARD SPRINGS

LEE SPRING CO., Inc.

30 MAIN STREET BROOKLYN, N. Y.



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Supplies and instruments of war are worthless unless they reach the front. Rugged SAFETEX GUMMED TAPE is doing its part, every hour, to deliver the goods. Sealed with SAFETEX TAPE every carton is bound to get there, securely and undamaged.

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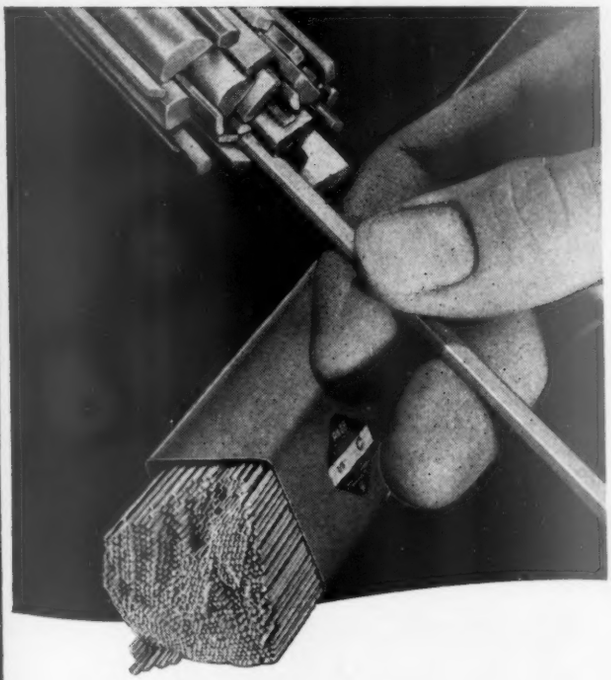
GUMMED TAPE

PAGE for WIRE



With mills practically at capacity producing wire for war and for essential industry, users of wire find that there are many things that they can do to conserve essential materials.

SHAPED WIRE: Use standard shapes. That can be done easily. **PAGE** has a wide variety, including ovals, hexagon, octagon, square, channel, keystone, flat, half-round, etc.—in diameters to 3/8"—with end section areas to .250 square inch.

WELDING ELECTRODES: Be certain that electrodes are correct in analysis for the job. Lean toward larger sizes for economy. See that no excess metal is deposited in the weld and that your men use electrodes right down to the holder.

GENERAL WIRE: The situation in such products as Spring Wire, Bond Wire, Telephone Wire, etc., is not subject to early improvement. It continues to be important to check waste.

If **PAGE** experience can help you work out any of these details, we will be glad to cooperate.

PAGE STEEL AND WIRE DIVISION

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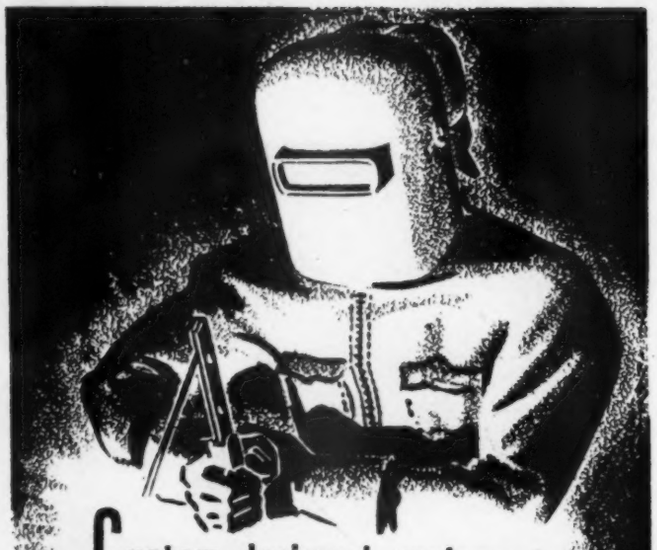

Custom designed equipment fabricated from steel plates and structural shapes

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Fabricators-Manufacturers-Engineers

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PULMOSAN EYESHIELDS

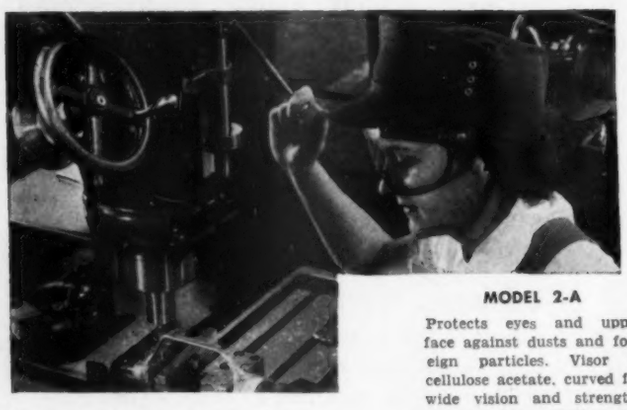


Photo Courtesy Sperry Gyroscope Co.

Types, Sizes and Shades for Chips, Sparks, Splashes, Glare

MODEL 2-A

Protects eyes and upper face against dusts and foreign particles. Visor of cellulose acetate, curved for wide vision and strength. Does not fog, permits wearing spectacles. Clear, green and amber shades. Get prices.

Practically every eye and face hazard in industry can be met with the comprehensive line of Pulmosan Face and Eyeshields. There are types for chipping, grinding, welding, brazing, soldering, metal pouring, chemical handling and other industrial operations.

Flexible, transparent shields are non-fogging, non-inflammable, do not interfere with glasses — provide light, cool, comfortable protection. Available in 4, 5, 6, 7, 8 and 9 inch lengths, clear or colored shields. All parts replaceable. Write Pulmosan for prompt service on Face and Eyeshields. Ask for literature and prices on complete line.

PULMOSAN SAFETY EQUIPMENT CORPORATION

Dept. P, 176 Johnson Street Brooklyn, N. Y.

(*Continued from page 252*)

particular that it is important for someone in authority to participate in the inspection.

"Another source was a rather large stock of experimental materials, products and machinery on which experiments had turned out to be unsuccessful, entirely completed, or for some reason abandoned. In many cases, the written record on the experimental results was found to make the physical efforts of the experiment no longer necessary.

"We picked up a good deal of material which we reasonably can re-work and re-use and in addition, a quantity of such miscellaneous currently usable supplies as nuts, bolts, bearings, etc., and also a substantial amount of such maintenance supplies as old pipes, tanks, plates etc., in such bad physical condition that they probably should never have been saved, but were an evidence of the careful frugality of foremen who, very properly, hated to throw anything away.

"There must be a good deal of such material in the country and I can sincerely recommend to any Purchasing Agent that he will find cooperation with the salvage program a pleasant and profitable experience that not too often accompanies the performance of what is an absolute patriotic duty."

1 1 1

SYNTHETIC RUBBER PROGRESS

Nation Now Practically "Over The Hump" of Rubber Dilemma

TECHNOLOGICALLY and from the sole standpoint of military needs, this country is practically "over the hump" of its rubber dilemma, according to one of the nation's most recently honored synthetic rubber experts.

Dr. L. B. Sebrell, head of The Goodyear Tire & Rubber Company's research department, who received one of the American Chemical Society's highest awards at its spring meeting in Detroit, expressed the opinion that the United States will soon be militarily independent of rubber from outside sources.

Research on synthetic rubber has progressed to the point, he said, that it can be converted into almost any needed war product if no more natural rubber were available.

Dr. Sebrell emphasized that his optimism regarding the technology of synthetic rubber is restricted entirely to war products now being made from synthetic rubber or which might some day have to utilize synthetic rubber.

Even perfectly satisfactory military tires from synthetic rubber are feasible, he said, with their efficiency and suitability decreasing in direct proportion to their sizes. Many synthetic rubber tires are being made today for jeeps, command cars, airplanes and similar equipment.

"Availability of heavy duty tires for civilians from synthetic rubber is a totally separate and unrelated factor," Dr. Sebrell asserted. "Tires of synthetic rubber for civilians and non-war trucking purposes is a problem which can be attacked more vigorously after the more pressing military aspects have been handled. But the day is not far off when we will be 'over the hump' in this respect also."

He pointed out that we are now trying to achieve in two years' time with synthetic rubber what has required nearly 100 years in the development of the compounding

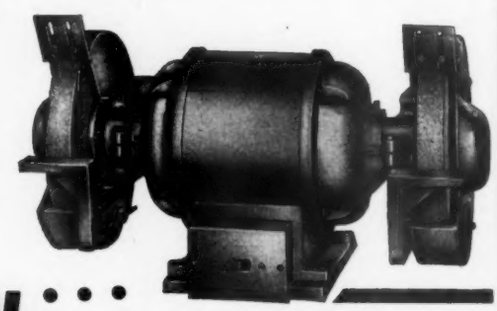
(*Continued on page 256*)

Making a part for another to build into his product calls for workmanship equal to his own. Accepting this responsibility in peace time placed "Newton" on the screw machine product "map." When, later on, "Newton" was privileged to serve those who were to serve the war effort, the set-up was made to order! Today's tonnage, though many times that of any peace time period, adheres to those same rigid quality standards which originally built the "Newton" business. Therefore, "Newton" service now extends the length and breadth of the land.

Schedules are now full for several months ahead; but, if you need products up to ¾", contact us — just in case there *might* be an open spot.

NEWTON SCREW MACHINE PRODUCTS
THE NEWTON MANUFACTURING CO., PLAINVILLE, CONN.

Valley Heavy Duty **GRINDERS** Ball Bearing **MOTORS**



V • • •

VICTORY on the production front is being aided mightily by the economical and faithful service of thousands of Valley motors and grinders in war plants everywhere.

Prompt delivery of Valley Equipment can be obtained by those authorized to purchase.

Valley Ball-Bearing Motors from ½ h.p. to 75 h.p. . . . Grinders from ¼ h.p. bench type to 5 h.p. pedestal models.

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Preventing fires before they start, Justrite Safety Cans, Safety Filling Cans and Oily Waste Cans are doubly valuable to industry today. Sturdily built to rigid safety specifications, they give you the safe, sensible method of handling and storing 'flammable fluids and oily waste. "Must" equipment for factories, ships, ship-yards, oil derricks, refineries, etc. Ask for specifications and prices!

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Approved and listed by Underwriters' Laboratories, Inc., and Approved by Associated Factory Mutual Fire Insurance Cos. A necessity wherever explosive or 'flammable liquids are poured into fuel tanks. 24 gauge steel body, baked enamel finish. Available today.

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JUSTRITE *Safety Products*

SAFETY CANS · FILLING CANS · OILY WASTE CANS
APPROVED SAFETY ELECTRIC LANTERNS

(*Continued from page* 254)

and applications of the natural product. There are many further steps and refinements in uses of synthetic rubber which can and will continue to be made, he said.

The Goodyear research expert was careful not to claim identical qualities for synthetic rubber in uses to which natural rubber is being put at present.

"Obviously," he continued, "synthetic rubber is going to be poorer in some cases and for some purposes, just as it's superior in others. But we've reached the point, I think, where synthetic rubber can be adapted to all necessary military uses without dangerous losses in efficiency or other qualities".

Dr. Sebrell reviewed many tests which had been made to provide comparison between synthetic rubber—butyl and the buna types—and natural rubber.

Many of the tests, he disclosed, showed one type or another of synthetic rubber to be superior to natural rubber for certain specific purposes.

With regard to tensile tests, Dr. Sebrell said that "it is well-known that in pure gum stocks the tensile strength of the butadiene copolymers (buna types) is not as good as that of natural rubber, while that of the butyl rubber does not compare too unfavorably with that of natural rubber."

Dr. Sebrell said that the buna types of synthetic rubber are generally the equivalent of natural rubber from a standpoint of flexibility although the acrolynitrile type of buna rubber more rapidly loses this flexibility at low temperatures.

Emphasizing that the oil-resistant buna types of synthetic rubber are markedly superior to natural rubber in resistance to gasoline, benzol and similar substances, Dr. Sebrell continued: "Natural rubber has the highest resilience of any of the rubbers although synthetic rubbers show more improvement in resilience as temperatures are increased than does natural rubber."

In abrasion resistance, according to Dr. Sebrell, "all synthetic rubbers are more resistant than are similar compounds prepared from natural rubber."

Natural rubber is much more easily plasticized by milling than the synthetics. Natural rubber is less resistant to oxidation than is butyl, while the buna types are superior in the entire group in this respect.

* * *

CORK STOCKS REACH ALL-TIME PEAK

A long range cork program has been announced by the Cork, Asbestos & Fibrous Glass Division of the War Production Board.

Officials stated that in view of the fact that over-all cork stocks in this country are at an all-time peak and since potential supplies are available in Portugal, Spain, and North Africa, it was felt that attention should now be given to reducing Government-owned stockpile of cork.

Sales of Government-owned cork will be made shortly to industry and over a period of the next year further sales will be made, reducing the Government cork stockpile to approximately two-thirds of its present size. It was further stated that the balance, after such sales, would constitute a minimum reserve to be retained for the duration of the war or until all uncertainties regarding imports are removed.

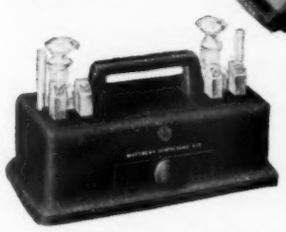
As over-all cork stocks have grown, Division officials stated, restrictions on the use of cork have been gradually removed until industry is now operating on a practically unrestricted basis except for a rather liberal

(*Continued on page* 258)

Amazing S-22 Synthetic

ETCHING STAMPS

Thousands of our new "S-22" Synthetic stamps now in service have proved that this new material outlasts rubber or other synthetics by from 3 to 4 times, when used with acid etching inks. Order "S-22" next time you need inspection stamps.



INSPECTOR'S KIT

Made of acid proof, non-critical material, this new Kit holds stamps, etching ink, ink pad and neutralizer. Inexpensive, compact and convenient. Write for quotation.

Write for Bulletin S--Catalog 146

This valuable bulletin illustrates the various styles of stamps available. Write for your copy today.

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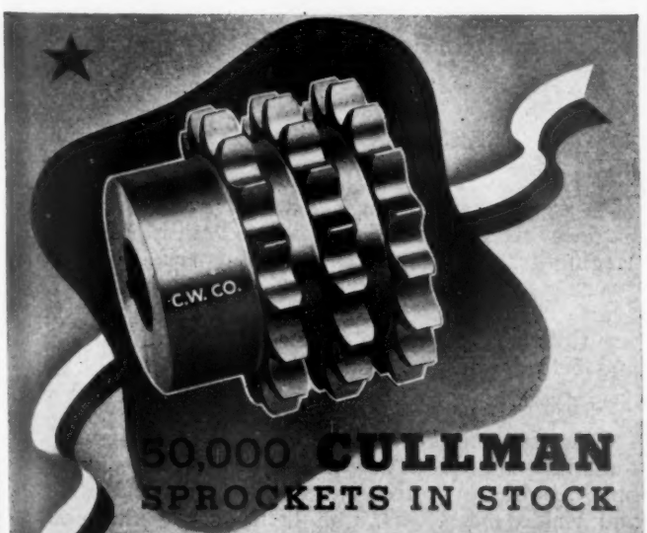


50,000 CULLMAN SPROCKETS IN STOCK

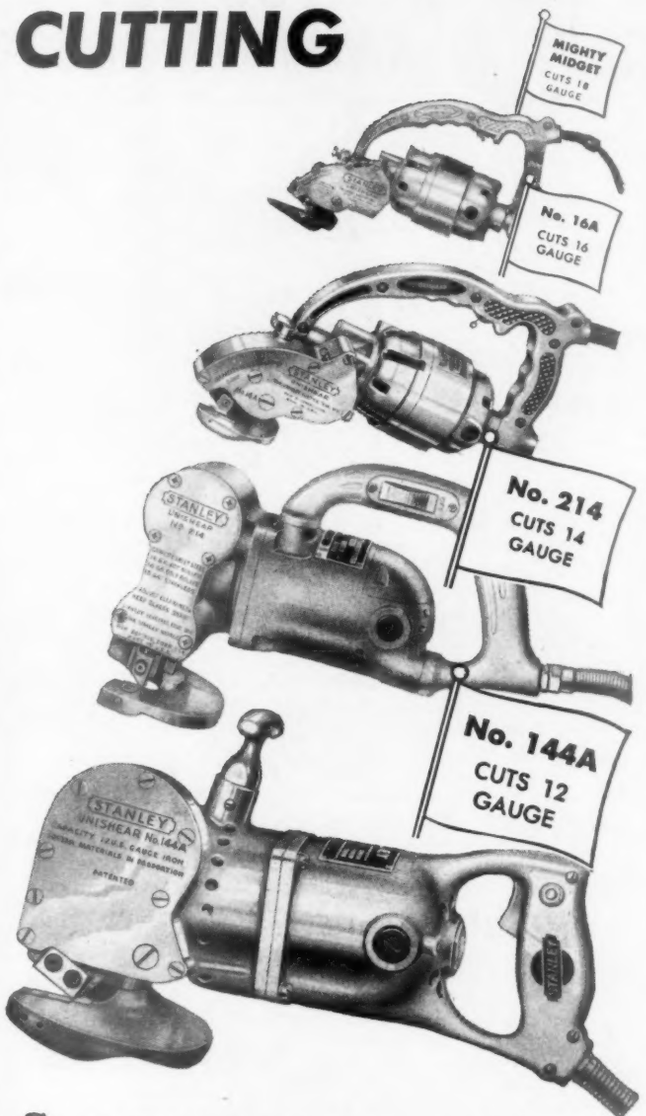
Quick delivery from stock can be made on more than 2,000 types and dimensions of Cullman Sprockets. Because of specialized experience and equipment, special sprockets can be made to order promptly and at a comparatively low cost.

The Cullman catalog lists sprockets and chains carried in stock, and gives information and tables of value to sprocket users. Write for your copy.

CULLMAN WHEEL CO.

1352-P ALTGELD STREET, CHICAGO, ILLINOIS

OUT IN FRONT for SHEET METAL CUTTING



Stanley Unishears reduce sheet metal cutting to a simple operation. They can follow any line that comes off the drafting board—without wasting a single ounce of metal.

With a little practice anyone—man or woman—can cut straight or curved lines, angles and complicated notches quickly, without burrs or distortion of the metal. Capacities from 18 gauge up to 10 gauge on hot rolled steel or galvanized iron. Ask your distributor for complete information. Stanley Electric Tool Division, The Stanley Works, New Britain, Connecticut.

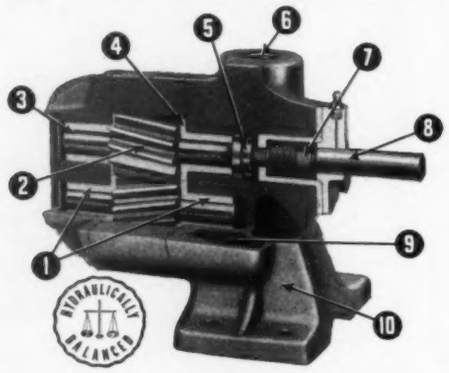
STANLEY Trade Mark 1843 - 1943

STANLEY UNISHEARS

THE ELECTRICALLY DRIVEN HAND SHEARS

NOTE THESE FACTS BEFORE YOU BUY ANOTHER PUMP

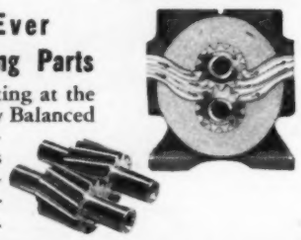
Ten Reasons for Choosing **ROPER**



1. LARGE BRONZE BEARINGS—two on each side.
2. SPIRAL PUMPING GEARS — Perfectly machined and run-in.
3. CONSTANT LUBRICATION — (1) by liquid being pumped and (2) by lubricating qualities of the bearing metal used.
4. WEAR PLATES protect face and back plates from wear by foreign matter.
5. THRUST COLLAR on drive shaft plus sliding joint takes up shock and thrust.
6. FOUR PIPE OPENINGS provide eight different piping arrangements.
7. MECHANICAL SEAL reduces power requirements and keeps leakage to minimum.
8. SPLINED DRIVE SHAFT forms sliding joint with gear to absorb shock and thrust.
9. ALWAYS PRIMED—after once primed and in operation.
10. ONE PIECE BACKPLATE protects working parts from stress and strain.

Simplest Principal Ever Designed . . . Only 2 Moving Parts

Equal size pumping gears operating at the same speed. Roper Hydraulically Balanced Pumps, quiet and smooth in operation, last longer with less servicing because of their simplicity and because internal pressure is equalized at all points.



ENGINEERING SERVICE

Roper Sales and Engineering Service reaches from coast to coast. All representatives have a thorough knowledge of engineering and a wealth of practical experience. Their services are promptly available to help you solve your pumping problems.

Write for Catalog **No. 837**

With many illustrations, cut-away views, drawings, dimension and pumping capacity tables and complete information on Roper Pumps.

ROPER *Rotary* PUMPS

GEO. D. ROPER CORP., ROCKFORD, ILL.

(*Continued from page 256*)

allocation procedure. Also, industry's reporting forms have been greatly simplified.

Officials said that industry could expect to continue to operate on this basis as long as it carries at all times an amount of cork equal to the minimum which the Government carries. Thus the recommended minimum over-all cork stocks will be carried by Government and industry on a 50 - 50 basis. Each cork manufacturer using raw cork will be expected to carry his proportionate share of the minimum required stocks.

ARMY BUYING NYLON ROPE

Nylon is now being used to manufacture climbing ropes for Mountain Troops. A synthetic nylon which is stronger, tougher and much less susceptible to water than either manila or sisal has been adopted by the War Department for making rope for this purpose, it is announced.

The new use for this type material was evolved by the Quartermaster Corps in its search for a satisfactory substitute to relieve the drain on our stocks of manila fiber, the main source of which has been lost to the United States.

Extensive tests, by both the Quartermaster Corps and the Bureau of Standards have shown that not only is the tensile strength of the nylon rope greater than that of manila but it has three times the elasticity. These are important factors in mountain climbing where breaking of possible falls or drops must be taken into consideration. In addition, it absorbs one-third less water, an important factor during wet weather.

It has a third more resistance to abrasion or ability to stand wear and tear when in contact with rough surfaces such as the edges of rock, it is explained. When used with pulleys or for similiar operations, its life is approximately 15 times longer.

TRASH HEAP TURNS TO GOLD

AN industrial trash heap may actually be a gold mine of scarce war materials, a Westinghouse engineer recently told the Canadian Transit Association. Urging transit systems to adopt material-saving programs as intensive as those of most railroads, W. J. Clardy, of the Westinghouse Electric and Manufacturing Company, explained how one railroad struck gold and helped relieve wartime shortages.

36 Carloads of Materials

This railroad removed 36 carloads of useful war materials from a single trash pile that was supposedly only a nuisance. Later this same heap was mined again and yielded nearly 400 tons of material which gave a net return of $1500 after paying all salvage costs.

Street railways, bus and trolley coach lines and other transit systems can also aid the war effort by using substitutes for scarce materials and repairing parts and tools that would ordinarily be scrapped, Mr. Clardy pointed out. Bus and trolley coach tires made of half synthetic rubber and half crude have piled up as much as 50,000 miles service and are still running. Smaller tires made wholly of synthetic rubber are also being tested with good results. With synthetic rubber production steadily mounting the United States and Canada may in the future require no imports of natural rubber.

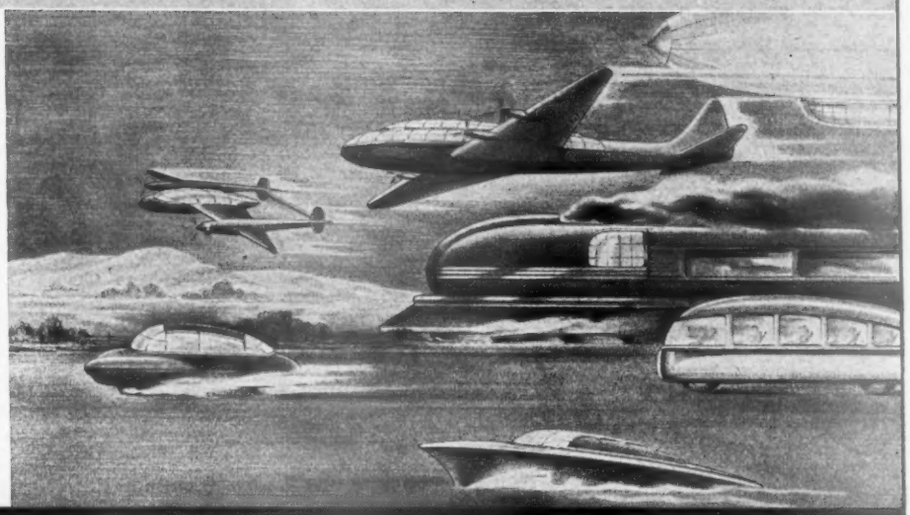
Special high temperature solder for repairing electri-

(*Continued on page 260*)

Complete Follow Through Service

Plastics fabrication . . . by Reynolds . . . is all inclusive. For here a skilled and experienced organization takes over completely and from start through finish and scientifically checks every production operation. Today, tomorrow and beyond . . . Reynolds complete follow through service . . . will serve you well.

Invest in War Bonds



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CAMBRIDGE, OHIO

SALES ENGINEERS IN ALL PRINCIPAL CITIES

DIVISION OF REYNOLD'S SPRING COMPANY, JACKSON, MICHIGAN

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protect engine parts in shelf storage with...

TURCO #20 RUST-BAR

- Specifically formulated to protect aircraft interior engine parts during storage or shipment . . .
- Counteracts corrosive effects of engine combustion products on ferrous and non-ferrous metal parts . . .
- A thin, transparent film . . . dries to a tough, non-greasy surface . . . will not run off in extreme heat . . . will not crystallize or crack in extreme cold . . .
- A simple, economical easy-to-apply method of safeguarding vital parts from the time the engine is uncrated until the initial ground run-up.

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THESE COMPACT, EC Ball Bearing Pillow Blocks will improve the efficiency of all kinds of machines. They are inexpensive, reliable, foolproof and easy to install.

These important features are:

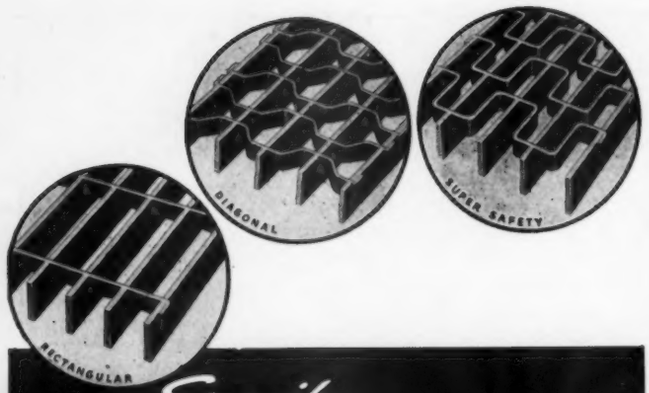
- Full internal Self-Aligning Ball Bearings—with maximum number of balls and Automatic Alignment.
- Attractive, well designed housing—easily opened for bearing inspection. Large Lubricant capacity.
- Labyrinth Type Seals—Frictionless, long wearing and exceptionally effective; keep lubricant in and dirt out.
- Expansion or non-expansion type, optional at no extra cost.
- Closed end-cap optional and interchangeable on standard units.
- This EC Series is available in shaft sizes from ¾" to 2 3/16".

CJB AHLBERG

AHLBERG BEARING COMPANY

Manufacturers of CJB Master Ball Bearings

3039 WEST 47th STREET • CHICAGO, ILL.



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Write, wire, or phone us about any industrial problem you have, especially if government specifications are required.

for **INDUSTRIAL FABRICS**
Sheetings, muslins, osnaburgs, drills, ducks and flannels in original pieces—filter and straining cloths of all types—we also cut strips to any widths suitable for industrial purposes.

for **CHEESECLOTHS**
All grades and thread constructions of bleached and unbleached cheesecloths — all are commercially lintless. Also mill remnants as low as 1½c per yard.

for **CANVAS**
Plain, waterproofed, and fireproofed canvas cloth. Also, dropcloths, containers, filter cloths, etc. made to order.

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Factory hand towels, machinery wiping towels, dish and glass wiping towels.

for **WIPING CLOTHS**
Only bleached white, laundered and ironed cloths—can be washed and used over and over again—several sizes available.

Write, wire or phone for any samples or prices.

BURCOTT MILLS 616 W. FULTON ST. CHICAGO, ILL.

(*Continued from page 258*)

Special high temperature solder for repairing electrical transport apparatus is now made without tin, imports of which have been largely cut by Japanese conquests in the Pacific. Pure tin solder has been replaced by a type using only 15 per cent of that scarce metal. Tin in babbit metal for bearings can almost be eliminated and the bronze shells for journal bearings can often be reduced to half their former thickness.

Mr. Clardy also told how one railroad saved 5000 tons of scrap and $27,000 in a single year by establishing a plant to reclaim worn locomotive and car parts and tools. Brake beam rods were cut up into machine bolts. Scrap springs were machined to make stone chisels, wrenches, nail pulling bars and packing hooks for journal boxes. Engine truck axles, too worn for that important job, were turned into half a dozen types of smaller and less important parts. Larger sizes of scrapped lumber were trimmed down. All kinds of tools were given new edges and re-tempered so they could be used again.

The materials shortage is so acute that even uneconomical salvage projects should be undertaken. Digging up abandoned oil, gas, water and steam lines usually costs more than the metal's dollar value; however, such lines should be recovered to swell the metals stockpile. There are hundreds of profitable material-saving ideas which still lie dormant. It is those ideas that are needed to step up production capacity.

COPPER RECOVERY AIDS WAR EFFORT

THE extent to which the War Production Board's copper recovery program is aiding the Nations war industries is shown by the fact that to date 197,000,000 pounds of "idle and excessive" copper, both in primary and fabricated forms, have been allocated for war use.

The amount, WPB announced, represents two-thirds of the total amount of copper thus far reported under the program. Of the remaining 100,000,000 pounds reported, approximately 36,000,000 pounds consist of assembled products contaminated with materials not suitable for copper scrap. Arrangements for the movement of the balance are currently being made at Copper Recovery Corporation.

Original estimates were that "idle and excessive" copper to be recovered ranged from 400,000,000 to 500,000,000 pounds. So far, 114,000 firms have been approached in connection with the recovery program and plans are under way to reach 98,000 plumbers, building contractors and their suppliers.

QMC ESTABLISHES FUELS AND LUBRICANTS DIVISION

Establishment of a Fuel and Lubricant Division in the Office of the Quartermaster General has been announced by the War Department. The new Division will be responsible for the procurement, storage and distribution of petroleum products, fuels and lubricants for the Army except certain special lubricants and greases used with weapons and fuels and lubricants used by Army aircraft. Colonel William E. R. Covell has been named chief of the new division.

The order establishing the new division concentrates in one department all of the staff functions relating to

(*Continued on page 262*)

In a busy depot stacking yard, men unload boxes of automobile parts to be reshipped on a railroad built and run by U. S. troops.

SIGNODE

Vital Service on the SUPPLY FRONT

Backing up the widespread battlefronts are many supply fronts, and Signode-strapped shipments are reaching all of them. Signode's war job is helping to safeguard war materials shipped to our fighting men.

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Remember your nearest Signode representative is ready to help assure safe delivery of *your* vital war products.

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THE SUPERIOR TANTALUM-TUNGSTEN CARBIDE TOOLS

Very Handy

FOR THE ASSEMBLY LINE

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The FAIRMOUNT TOOL & FORGING CO.

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(*Continued from page 260*)

the Army's gasoline, motor oil, coal, fuel oil, coke and lubricating grease, except those connected with weapons and airplanes.

The new division also will handle the procurement, storage and distribution of all containers for fuel and lubricants. Its responsibilities will include suppling coal needed to heat Army posts, camps and stations; gasoline and motor oil to keep Army trucks moving around the world; fuel and lubricating oil for the Army Transport Service and its thousands of boats ranging from huge transports to small harbor craft; gasoline and grease for the Armored Force's tanks, and numerous other duties.

* * *

SALES OF ENEMY PROPERTIES

Alien Property Custodian Leo T. Crowley has issued an order prescribing conditions under which enemy properties held by his office ultimately will be offered for sale.

General order 26 provides three means of sale for vested business properties;

Properties valued at less than $10,000 ordinarily may be sold at either public or private sale; larger business properties will be disposed of through public sales, ordinarily through the method of sealed, competitive bids; some properties will be disposed of in government-regulated securities markets.

The order anticipates that many properties will be sold to other departments or agencies of the United States Government, or at their request under regulations fully protecting the interests of the United States.

Real Estate will be disposed of through recognized brokers, while perishable or expendable commodities ordinarily will be sold privately at prevailing market prices.

Mr. Crowley emphasized that no properties yet are up for sale. Each public sale will be advertised at least 15 days in advance in a newspaper of general circulation in the place where the property is located and in trade papers and other appropriate publications.

The intent of the regulation prescribed under the order is four-fold:

To protect the public interest, to further the war effort, to protect the interests of the United States and of purchasers, and to obtain maximum prices for the properties offered for sale.

* * *

INTERPRETATION NO. 11 CMP REG. NO. 1

To avoid production delays a manufacturer may use an allotment to replace in inventory the controlled materials used to manufacture the product for which the allotment was originally made. According to interpretation No. 11 to CMP Regulation No. 1, announced by War Production Board, the quarter for which an allotment is made and the quarter in which delivery of a Class A product is to be made need not be the same, making it possible for a manufacturer to use an earlier or a later quarterly allotment to fit in with production needs.

However, a manufacturer of Class A products may refuse an order unless his customer makes an allotment of enough controlled materials to fill it, even though he may have sufficient in inventory. The manufacturer must, however, accept such an order if he has enough material in excess inventory to fill the order.

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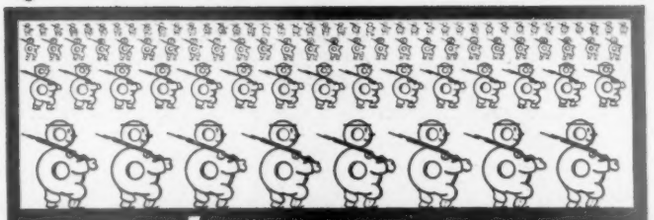

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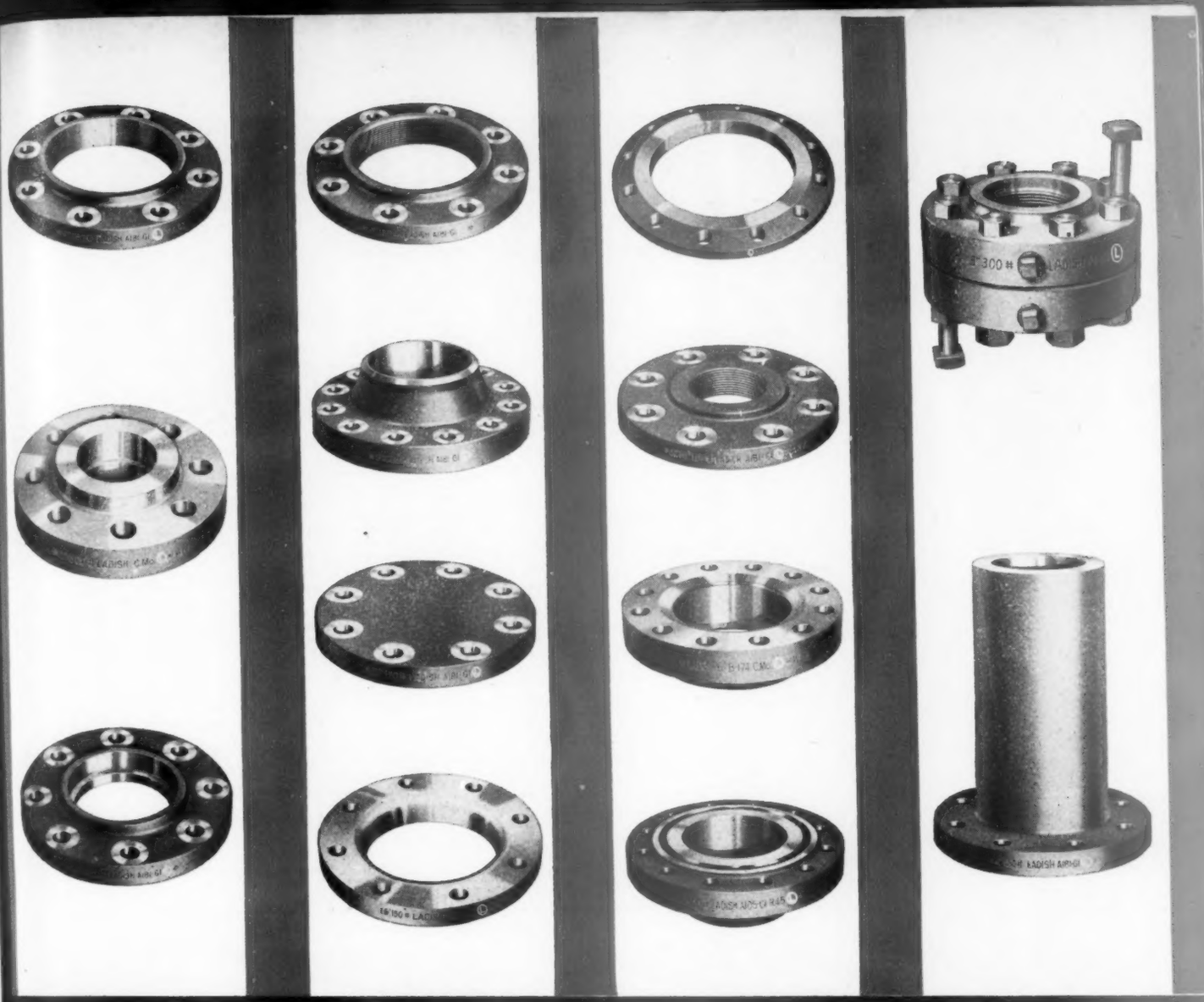

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